

"Translations of the original instructions"

INTRODUCTION

First of all we wish to thank you for choosing to use a **TECSYSTEM** product and we strongly suggest that you read this instruction manual carefully: You will understand the use of the equipment and therefore be able to take advantage of all its functions.

PAGE

ATTENTION! THIS MANUAL IS VALID AND COMPLETE FOR THE EXTRACTOR TRBH.

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CONTROL BOX SAFETY REGULATIONS



ATTENTION:

Read the manual carefully before starting to use the control unit. Keep the instructions for future reference.

Do not open the device, touching any internal components can cause electric shock. Contact with a voltage over 50 Volts can be fatal. To reduce the risk of electric shock, do not dismantle the back of the device for any reason. Moreover its opening would void the warranty.

Before connecting the device to the power supply, make sure that all the connections are correct. Powering the control box / fans lines, with the control unit NT935 disconnected / faulty or with the fan data cable disconnected / faulty, the SAFETY SPEED function is enabled. The speed safety function automatically starts the fans at speed 5, do not touch the running fans, risk of injury. Always disconnect the unit from the supply before any cabling modification.



Any work on the equipment must be entrusted to a qualified engineer.

Failure to comply with these instructions can cause damages, fires or electric shock, and possible serious injuries!

POWER SUPPLY

Before using it, make sure the power cable is not damaged, knotted or pinched. Do not tamper with the power cable. Never disconnect the unit by pulling the cable, avoid touching the pins. Do not carry out any operations of connecting/disconnecting with wet hands. To disconnect the device, do not use objects such as levers. Disconnect the power supply immediately if you notice that the device gives off a burning smell or smoke: contact the assistance.

LIQUIDS

Do not expose the equipment to splashes or drops, do not position it in places with humidity exceeding 90% and never touch with wet hands. If any liquid penetrates the control unit, disconnect it immediately and contact technical service.

CLEANING

Disconnect the power cable before cleaning the control unit, use a dry cloth to dust it, without any solvent or detergents, and compressed air.

OBJECTS

Never insert any objects into the cracks of the control unit. If this happens, disconnect the control unit and contact an engineer.

USE RESERVED TO QUALIFIED PERSONNEL

The purchased goods are a sophisticated electronic device that is totally unsuitable to be used by non-qualified personnel. Any work must be carried out by a specialist engineer.

ACCESSORIES

The use of non-original accessories or spare parts can damage the unit and endanger users' safety. In the event of faults, contact technical service.

POSITIONING

Install the control unit indoors, in a place protected from water splashes and from the sun's rays. Do not place near heat sources exceeding the parameters stated in this manual. Position on a stable surface, far from any possible vibrations. Position the unit as far as possible from any intense magnetic fields.

REPAIRS

Do not open the control unit. For any fault, always use qualified personnel. The opening of the control unit and/or the removal of the series identifying label entails the automatic forfeiture of the warranty. The Warranty seal is applied to all devices, any attempt to open the unit would break the seal and cause the consequent automatic forfeiture of the warranty.

TECHNICAL INFORMATION

Mail: ufficiotecnico@tecsystem.it - tel: 02/4581861

FANS SAFETY REGULATIONS

Read the manual carefully before starting to use the fans. Keep the instructions for future reference.

Do not touch/disassemble the bar or the fans while they are in operation: RISK OF INJURY. The product must be installed in a place with access limited to qualified personnel only. Any work on the equipment must be entrusted to a qualified engineer.



Do not touch the motor or the power cables. Contact with a voltage over 265-187 Volts AC can be fatal. To reduce the risk of electric shock, do not dismantle or modify the fan motor for any reason.

Before connecting the system to the power supply, make sure that all the connections are correct. Powering the control box / fans lines, with the control unit NT935 disconnected / faulty or with the fan data cable disconnected / faulty, the SAFETY SPEED function is enabled. The speed safety function automatically starts the fans at speed 5, do not touch the running fans, risk of injury. Always disconnect the fan from the power supply before performing any type of maintenance.



Never touch the motor, danger of burns: RISK OF INJURY.

POWER SUPPLY

Before using it, always make sure the power cable is not damaged, knotted or pinched. Do not tamper with the power cable. Never disconnect the unit by pulling the cable, avoid touching the pins. Do not carry out any operations of connecting/disconnecting with wet hands. Do not use items such as levers to disconnect the system power supply. Immediately disconnect the device if there is a smell of burning or smoke. Contact the Tecsystem technical assistance.

LIQUIDS

Do not expose the product to dripping or splashing liquids. Do not place in places with humidity over 90% and never touch with wet or damp hands.

CLEANING

Before cleaning the fan, always disconnect the power cord. To avoid malfunctions only use compressed air to remove dust and dirt. Do not use lubricants or greases of any kind.

OBJECTS

Never insert objects into the air inlet or outlet, if this happens disconnect the fan and contact a technician.

USE RESERVED TO QUALIFIED PERSONNEL

The purchased product is a sophisticated electro-mechanical device that must never be used by non-qualified personnel. Any work must be carried out by a specialist engineer.

ACCESSORIES

Do not use non-original accessories or spare parts, it could cause damage to the fan and compromise the safety of the user. In case of faults, contact technical assistance.

POSITIONING

Install the fans indoors, in a place protected from water splashes and from the sun's rays. Do not place it near sources of heat

above the parameters indicated in this manual. Place horizontally and on stable surfaces. The product must be installed in a place with access limited to qualified personnel only.

REPAIRS

Do not repair or modify the fan yourself. For any fault, always use qualified personnel. Opening or tampering with the fan will automatically invalidate the warranty.

PRODUCTION

The date and the production batch of the product are shown on a label placed on the fan. Removal of the label entails the automatic forfeiture of the warranty.

TECHNICAL INFORMATION OR REPORTING INFORMATION

Mail: ufficiotecnico@tecsystem.it - tel: +39 024581861

CONTROL BOX EXT. TECHNICAL SPECIFICATIONS POWER SUPPLY	
Nominal values for the BH motor line power supply	230Vac 50/60Hz Range 187-265Vac 50/60Hz
Direct connection with the Power-link source from the thermometric control unit	12VDC 30mA max
INPUTS	
Digital input for connection with the BH control units (BLDC IN)	•
OUTPUTS	
3 digital outputs to manage and control motors M1-M2-M3	•
3 L-N outputs for motors M1-M2-M3	230Vac 50/60Hz Range 187-265Vac 50/60Hz
I digital output for control box (BLDC OUT)	12VDC
DIMENSIONS	
106x108 depth.53.50mm	Din rail
TESTS AND PERFORMANCE	
Construction in compliance with CE regulations	•
Protection from electrical interference EN 61000-4-4	•
Ambient operating temperature from –20°C to +70°C	•
Humidity 90% non-condensing	•
P20 degree of protection	•
Housing UL 94V0 self-extinguishing Blend PC/ABS	•
Fan fault self-diagnosis circuit	•
Motor operation test key	•
Connections on removable terminal boards	•
Protection treatment of the electronic part	Optional

FAN'S GENERIC TECHNICAL SPECIFICATIONS	EXT.300BH
POWER SUPPLY	
Supply rated values	230Vac 50/60Hz
Min and Max. supply values	187÷265Vac 50/60Hz
Max absorption (speed S10)	90Watt
Power consumption in standby	500mWatt
Max current	0.70A
INPUTS	
Digital input for the control box connection	•
TESTS AND PERFORMANCE	
Ambient operating temperature from as indicated in the standard IEC 60076-11	•
IP40 degree of protection	•
Min and max speed (rpm)	700-1400
Max. airflow fan	1750 m³/h
Fan diameter	300mm
Motor protection: input fuse, thermal protection, current limiter, mechanical overload	•

TRBH SYSTEM PRESENTATION

The EXTRACTOR SYSTEM, installed into the box of the transformers or into the cabin, will allow the worm air extraction generated into the transformer ambient. The ventilation system and the regulation of the air flow of the fans will be managed by the thermometric control unit models: NT935BH-D and NT935BH-ETH.

The activation and shutdown of the ventilation system, programmable on the thermometric devices, they will be anticipated by 10° C with respect to the FAN2 ON threshold (programmed on CH4) ON speed S1 and OFF speed S0, maximum speed S10 will reach at the threshold value of FAN2 ON.

E.g. threshold programming FAN2 ON 40°C

- Activation of ventilation system TRBH ON 31°C, speed (rpm) fan S1.
- Switch off ventilation system TRBH ON 30°C, speed (rpm) fan S0

The speed regulation (rpm) on the fans is divided into 10 steps in relation to the temperature detected on the CH4 channel and to the FAN 2 ON value.

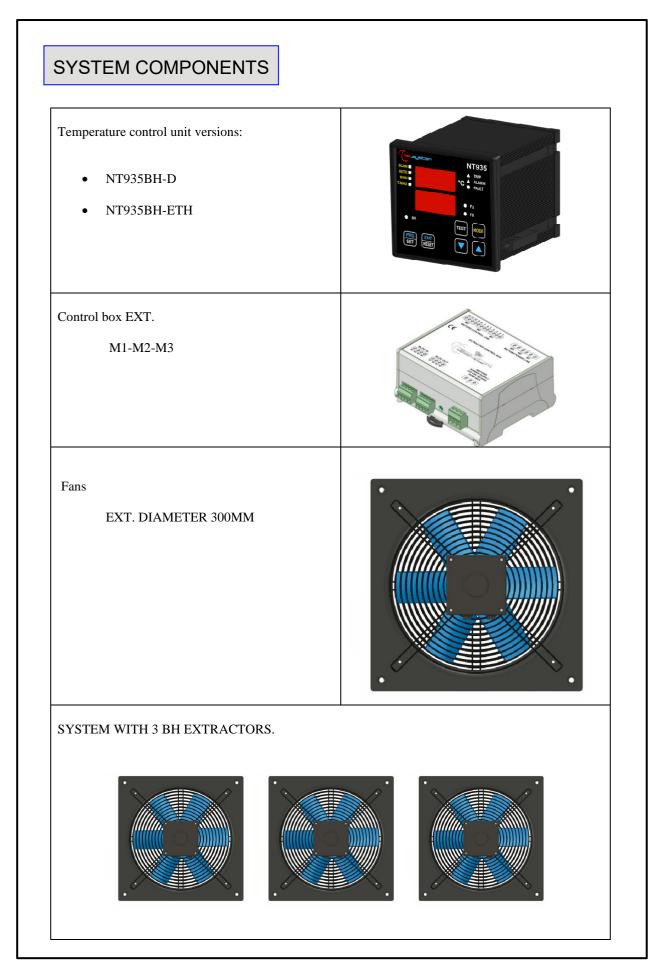
E.g. programming of the threshold FAN2 ON 40°C, the fan speed will progressively increase in relation to the temperature detected on the individual channel, see table example speed CH4.

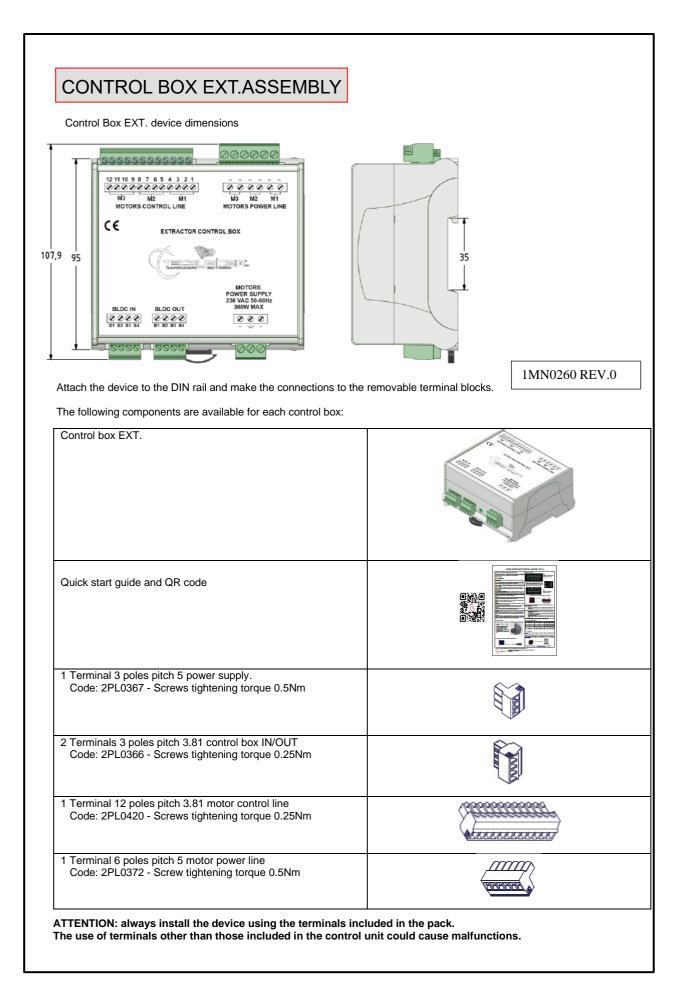
	Speed example table					
Temperature CH4	Speed S e Rpm Motor	Airflow m³/h				
		EXT.DIAM 300mm				
30°C	S0 = OFF	OFF				
31°C	S1 = 700	810				
32°C	S2 = 780	910				
33°C	S3 = 850	995				
34°C	S4 = 930	1100				
35°C	S5 = 1010	1218				
36°C	S6 = 1090	1330				
37°C	S7 = 1170	1450				
38°C	S8 = 1240	1570				
39°C	S9 = 1320	1660				
40°C	S10 / full Speed = 1400 rpm	1750				

The TRBH system will introduce the following advantages into your system:

- Containment of thermal and mechanical shock
- Stress reduction of the ventilation system
- Reduction in ventilation system consumption
- Reduction of noise emitted by the fans on average
- Motor fault identification and signalling
- Fan speed regulation
- Custom configuration of the ventilation system
- Fan protection for ambient overheating

In relation to the number of extractor installed, the TRBH system, trough the monitoring unit, provides the possibility of programming the number of connected fans 1-2-3.

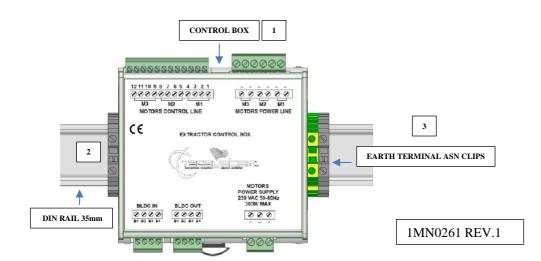




CONTROL BOX AND FANS ASSEMBLY

In order to facilitate the wiring from the control box to the extractors, place the control box centrally between the extractors. Position the control box inside a container with minimum internal dimensions 178x155x74mm prepared with a 35mm din guide or fix it on the wall using a 35mm din guide. Hook the control box (1) on the 35mm DIN rail (2). Secure the box by positioning the earth terminal and the clips (3)

supplied on the sides.

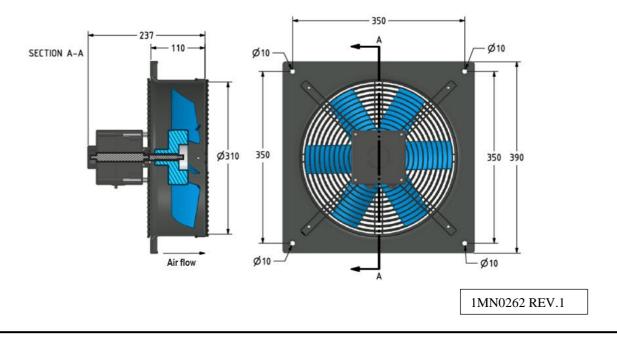


FAN DIMENSIONS BH

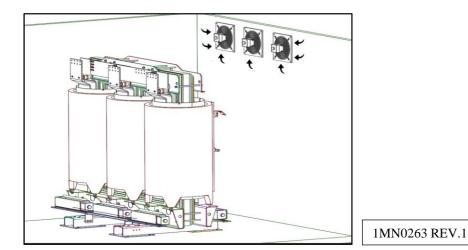
For correct installation of TRBH DIAM. 300 prepare a hole with minimum dimensions of 340mm on the part of the cabin/box.

Below is the drawing of the dimensions of the fan and the relative fixing points.

EXT. DIAM 300MM

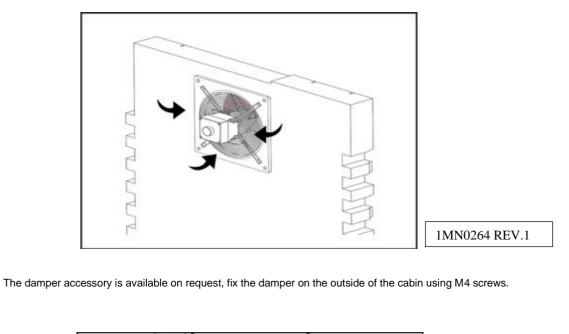


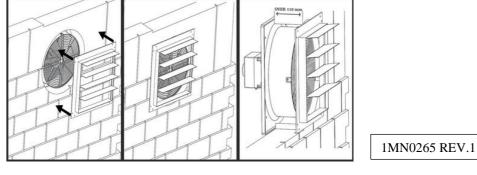
Position the extractors near the transformer inside the upper part of the cabin/box, always maintaining the safety distance from the windings indicated by the transformer manufacturer.

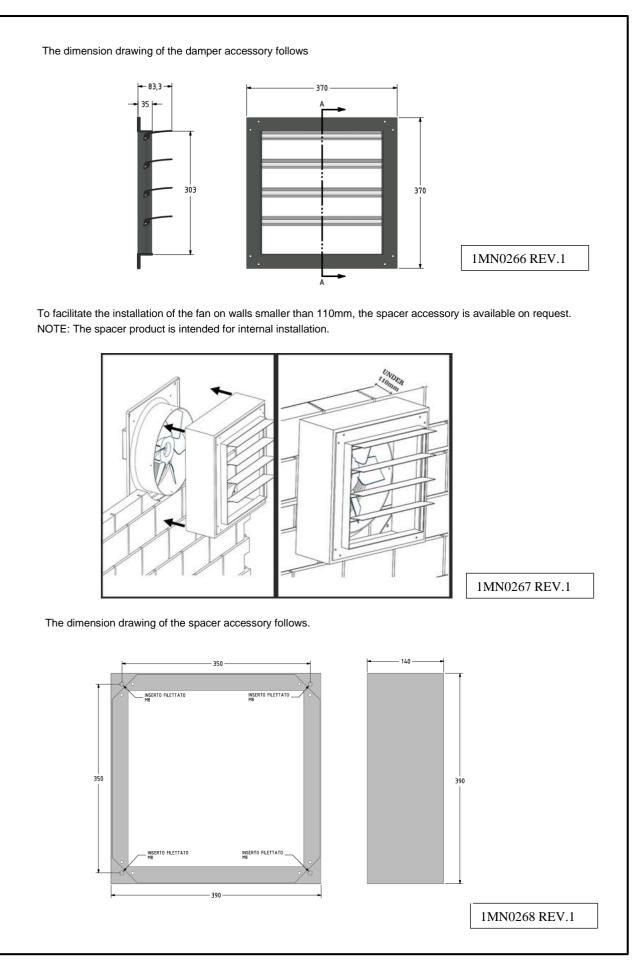


Fix the fan to the cabin wall using M8 bolts.

NOTE: extractor air intake from motor to impeller.







ASSEMBLY NOTES

Fix the fans using only the appropriate holes located on the structure. Do not modify the fan fixing holes. During the movement phase of the fans, avoid deforming the impeller fins. Do not under any circumstances modify the positioning of the motor and impeller or its configuration.

The maximum vibration level allowed is 60Hz.

ENVIRONMENTAL CONDITIONS OF USE

Absence of fine dust. Absence of flammable or corrosive gases. Relative humidity: 90% non-condensing (for short periods). NB: maximum temperature as prescribed by the IEC 60076-11 standard. Avoid installing it in a marine environment, except after specific treatment of the metal parts.

NOTE: failure to comply with the assembly notes and any use in critical environmental conditions such as: long periods of standstill, high humidity, high temperatures, excessive dust and excessive vibration, *can hasten deterioration of the mechanical parts of the fans.*

MAINTENANCE

In order to maintain the efficiency of the extractors, periodically perform (every 6 months) a cleaning intervention on them, using only compressed air. Do not use lubricants or greases of any kind.

Prolonged shutdown of the extractor could be the cause of faults. The installation of the extractors combined with the Tecsystem thermometric control units avoids any prolonged stops. Enabling the HFN function present in the Tecsystem control units it is possible to program activation cycles of the fans from 1 to 200 hours, recommended setting every 24 hours (for further information on the HFN function, check the manual of the control unit purchased).

NOTE: Periodic maintenance and activation of the HFN will contribute to extending the efficiency of the fans. Maintenance work on the fans must be programmed according to the environmental conditions in which they operate.

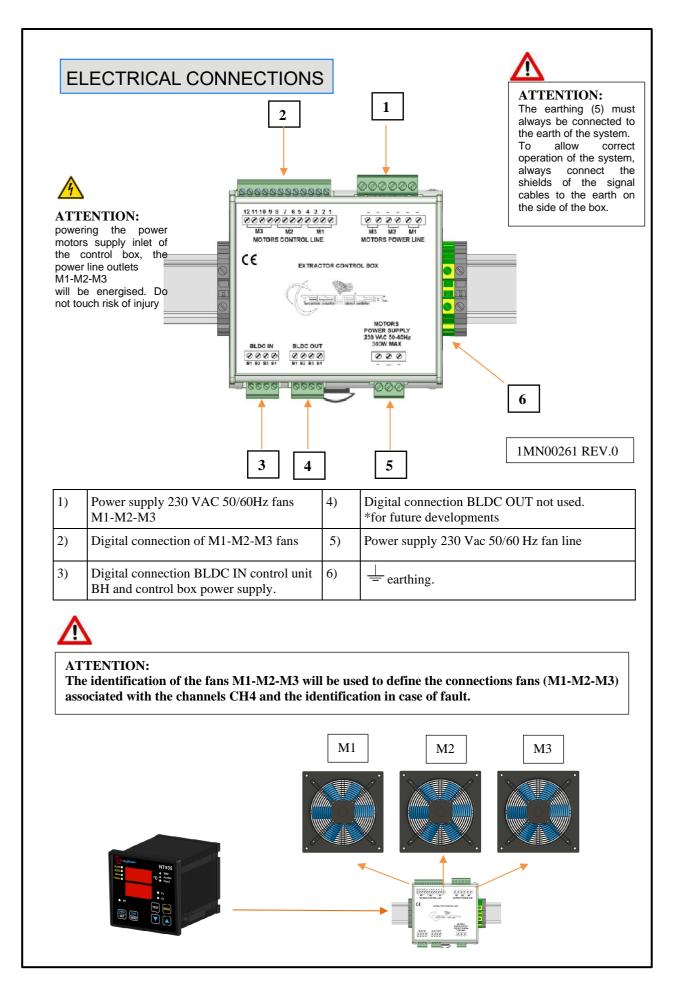
TRBH SYSTEM CONFIGURATION SELECTION

The customised configuration of the ventilation system provides for the possibility of programming, by means of the NT935BH temperature control unit, the number of extractors connected, following configurations selectable:

- 1) M1 1 fan connected (M1)
- 2) M2 2 fans connected (M1-M2)
- 3) M3 3 fans connected (M1-M2-M3)

NOTE: the fan speed adjustment (rpm) will be regulated by the channel CH4

In order to avoid malfunction signals, it is advisable to make the TRBH system connections respecting the selected configuration, see control box - fans connections from page 15.



CONTROL BOX POWER SUPPLY

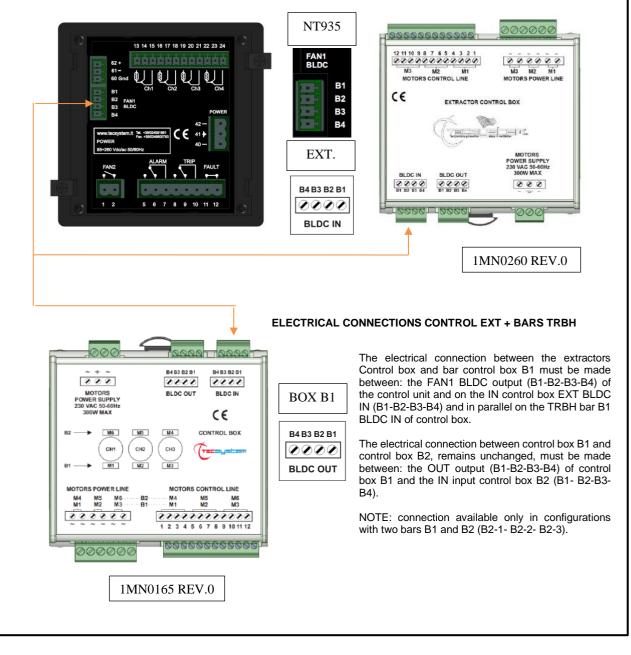
The control box has two dedicated power supplies:

- Digital power supply, input inlet, 12VDC 30mA max; it is used for the management and control of the control box. The digital power supply is supplied directly from the thermometer control unit.
- Power supply for 230Vac 50/60Hz motors, it is used to power the M1-M2-M3
- The earthing cable must always be connected to the earthing terminal ±.

If an existing control unit needs to be replaced with a new one, in order to guarantee its safe and correct operation, the connection terminals must be replaced with the new data terminals supplied.

ELECTRICAL CONTROL UNIT - CONTROL BOX EXT.

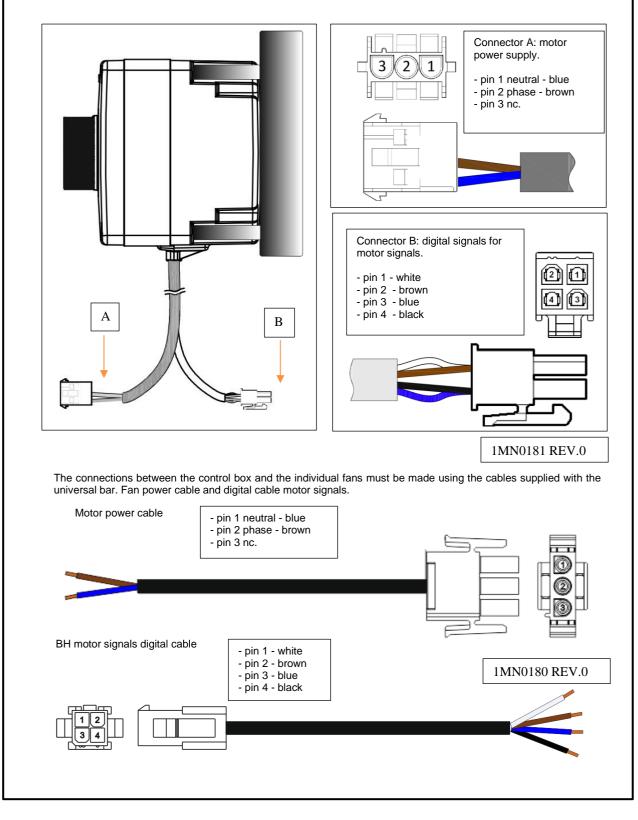
The electrical connection between the NT935 temperature control unit and the control box EXT. must be performed between: the FAN1 BLDC output (B1-B2-B3-B4) of the control unit and the BLDC IN of the control box ext. (B1-B2-B3-B4).

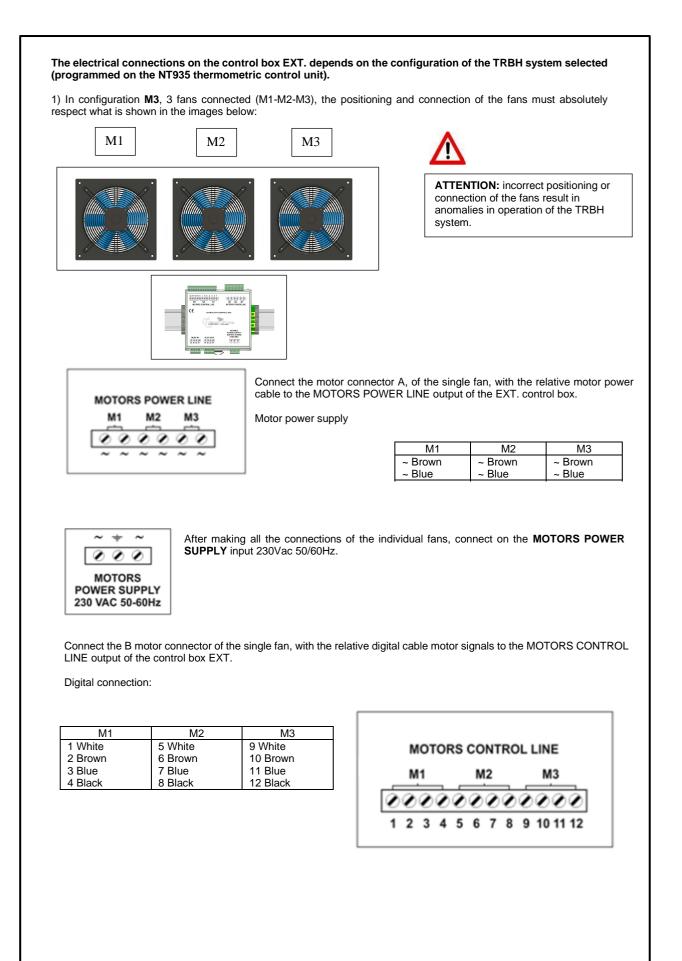


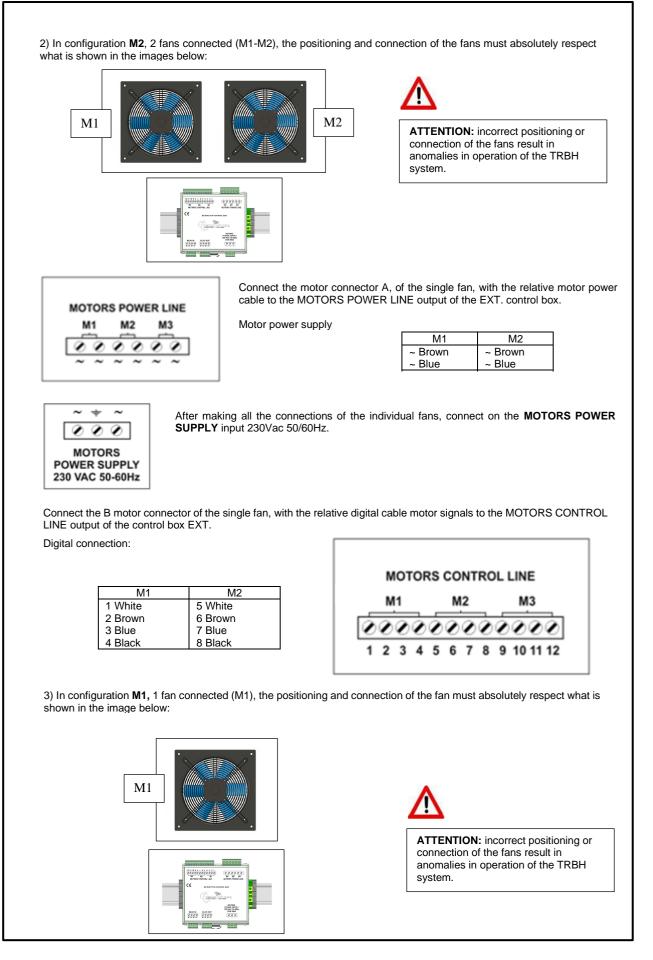
ELECTRICAL CONNECTIONS CONTROL BOX - BH EXTRACTORS

The motor has two cables, 250mm long, dedicated to the connection between the fan and the control box:

- A) Motor power supply connection: 3-pole female connector, 2x0.75 h05vvf cable with 6mm external diameter and BLACK colour
- B) digital connection of motor signals: 4-pole female connector, 4x0.35 liyy cable with 4.9mm external diameter and GREY colour.







MOTORS POWER LINE M1 M2 M3 O O O O O O O C O O O O O O

M1
~ Brown
~ Blue

Connect the motor connector A, of the single fan, with the relative motor power



After making all the connections of the individual fans, connect on the **MOTORS POWER SUPPLY** input 230Vac 50/60Hz.

cable to the MOTORS POWER LINE output of the EXT. control box.

Connect the B motor connector of the single fan, with the relative digital cable BH motor signals to the MOTORS CONTROL LINE output of the control box EXT.

Motor power supply

Digital connection:

M1	
1 White	
2 Brown	
3 Blue	
4 Black	

	N	11			Μ	12			Μ	3	
2	0	0	0	6	0	0	0	ó	0	0	0

NOTES: DIGITAL SIGNAL CONNECTIONS

All signal transport cables, components of the TRBH system (connections between: temperature control unit, control box EXT. must strictly respect the following rules:

- be separated from those of power
- be created with shielded and cable with twisted conductors
- have a section of at least 0.25 mm²
- be firmly fixed in the terminal blocks
- have the conductors tinned or silvered

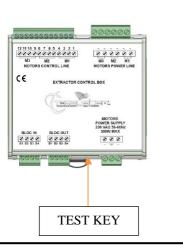
NOTE: the use of cables not complying with the above could cause possible reading anomalies. It is very important to always bear in mind that any disturbance on the signal lines could be the cause of anomalies.

FANS TEST

Pressing the test button of the single control box, it is possible to start the fan test.

During the fan test, the control box will activate in sequence, for approximately 10 seconds on a fan, the M1 - M2 - M3 fans

The function test of the fans has the purpose of verifying the correct positioning and wiring of the installed fans.



FAN DIAGNOSTICS

The NT935 BH control unit, connected to the control box EXT. is able to identify any faults on the ventilation bars. In the event of a fault, the display shows **BH Err**, followed by the relevant indication:

FLT RSE: communication failure with the control box EXT. **FLT ET:** failure of at least one motor M1-M2-M3

The fault signal **BH err** entails switching the FAULT contact of the NT935 control unit connected.

The NT935 BH models (D and ETH), through the Modbus Mapping, also allow monitoring of the speed (rpm) set by the control unit and the following failure cases for the single motor:

- Fan Speed
- motor over temperature (motor temperature over 70°C)
- general motor failure (motor blocked or under stress impeller disconnected from the motor shaft motor broken - errors or interruptions of electrical connections)

Safety speed function

The lack of communication between the control box or the fans, the control unit NT935 and the fans automatically enables the activation of the ventilation system in safety speed mode, set speed 5 on all the fans connected to the supply line.

Address LO (10)	Data HI	Data LO	Note	R: read W: write RW: read/write
73	00	Number of Extractor	Values: 00-03	R
74	00	TRBH_1 speed M1		R
75	00	motor status M1	See motors status	R
76	00	TRBH_2 speed M2		R
77	00	motor status M2	See motors status	R
78	00	TRBH_3 speed M3		R
79	00	motor status M3	See motors status	R

TRBH REGISTERS NT935BH (D and ETH)

BH MOTOR EXTRACTOR'S STATUS

BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
						Motor s	status

TRBH motor status: 00=OK

10=overtemperature

01=general motor fault

11= communication failure with the control box/bar

WARRANTY REGULATIONS

The purchased Product is covered by the manufacturer's or seller's warranty under the terms and conditions indicated in the "Tecsystem s.r.l. General Sales Conditions", which can be consulted on the website <u>www.tecsystem.it</u> and/or in the stipulated purchase contract.

The warranty is considered valid only when the product is damaged by causes attributable to TECSYSTEM srl, such as manufacturing or components defects.

The warranty is invalid if the Product proves to have been tampered with/modified or incorrectly connected and causing voltages outside the set limits and does not comply with the technical data for use and assembly, as described in this instruction manual.

The warranty is always ex Corsico as stated in the "General Conditions of Sale".

TROUBLESHOOTING	CAUSES AND SOLUTIONS
The control unit signals FLT RSE: communication failure with the control box.	Check the correct connection between the control unit and control box EXT., see control unit - control box connections on page 14.
The control unit signals FLT ET: failure of at least one motor M1-M2-M3.	Check the correct operation of the fans installed. Clean the fans using only compressed air.
Contact the TECSYSTEM Technical Department	if the problem persists.

EQUIPMENT DISPOSAL

The European Directive 2012/19/EU (WEEE) has been approved to reduce electrical and electronic waste and to promote the recycling and reuse of the materials and components of said equipment, cutting down on the disposal of the residues and harmful components of electrical and electronic materials.



All the electrical and electronic equipment supplied after 13 August 2005 is marked with this symbol, pursuant to European directive 2012/19/EU on electrical and electronic waste (WEEE). Any electrical or electronic equipment marked with this symbol must be disposed of separately from normal domestic waste.

Returning of used electrical appliances: contact TECSYSTEM or the TECSYSTEM agent to receive information on correct disposal of the appliances.

TECSYSTEM is aware of the impact its products have on the environment and asks its customers active support in the correct and environmentally-friendly disposal of its devices.

USEFUL CONTACTS

TECHNICAL INFORMATION: ufficiotecnico@tecsystem.it COMMERCIAL INFORMATION: info@tecsystem.it

