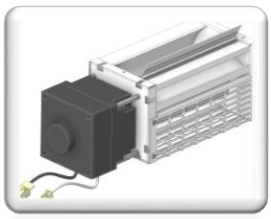
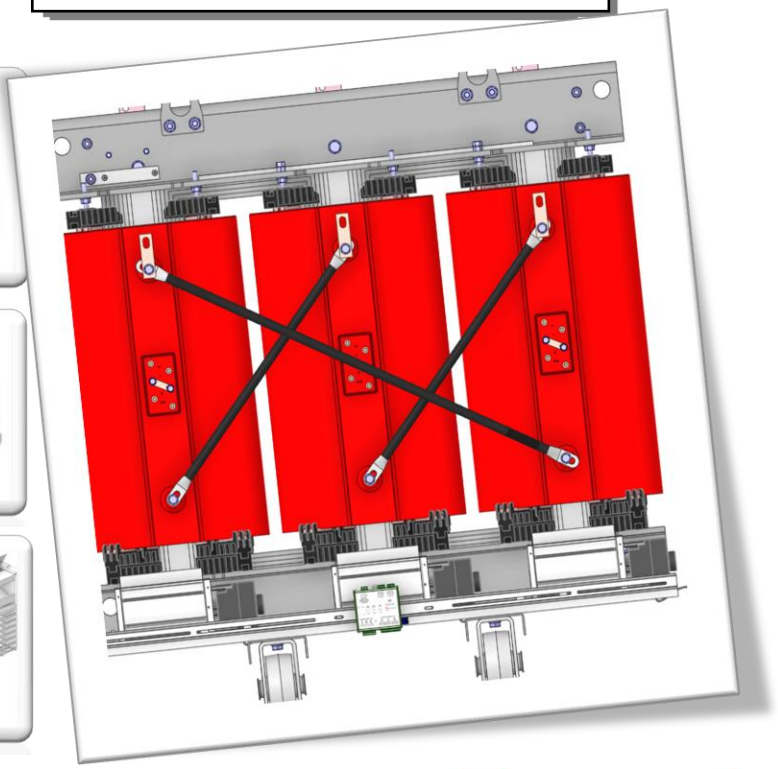
INSTRUCTION MANUAL

TRBH SYSTEM





operates with ISO9001 certified quality system

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R. 1.3 13/12/21

ENGLISH

"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.

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

TABLE OF CONTENTS

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

ATTENTION:

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 230 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 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 B1 (M1-M2-M3) and B2 (M4-M5-M6)	•
3 LN outputs for motors B1 (M1-M2-M3) and B2 (M4-M5-M6)	230Vac 50/60Hz Range 187-265Vac 50/60Hz
1 digital output for control box B1-B2 (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	•
IP20 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 GENERIC TECHNICAL SPECIFICATIONS	
POWER SUPPLY	
Supply rated values	230Vac 50/60Hz
Min and Max. supply values	187÷265Vac 50/60Hz
Max absorption (speed S10)	95Watt (TG500)
Power consumption in standby	500mWatt
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)	1500-2800
Motor protection: input fuse, thermal protection, current limiter, mechanical overload	•
EMC reference standard: EN61000-6-3, EN61000-6-2 and EN 61000-3-2	•

TECHNICAL SPECIFICATIONS OF FANS FOR MODEL			
MODEL	TG180BH	TG360BH	TG500BH
FAN LENGTH	180 mm	360 mm	500 mm
FAN DIAMETER	80 mm	80 mm	80 mm
MAX CURRENT	0.34A	0.55A	0.74A
MAX POWER	45W	75W	95W
FLOW RATE	450 m³/h	880 m³/h	1000 m³/h

BARS TECHNICAL SPECIFICATIONS			
MODEL	1200BH	1800BH	3600BH
FAN MODEL	TG180BH	TG360BH	TG500BH
BAR LENGTH	1400 mm	1800 mm	2300 mm
MAX FLOW RATE	1350 m³/h	2640 m³/h	3000 m³/h

TRBH SYSTEM PRESENTATION

The TRBH SYSTEM, installed on the resin transformers, will allow thermoregulation of the single phase U-V-W of the transformer. Activation of 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 FAN1 ON threshold (programmed on CH1-CH2-CH3): ON speed S1 and OFF speed S0, maximum speed S10 will reach at the threshold value of FAN1 ON.

E.g. threshold programming FAN1 ON 70°C

- Activation of ventilation system TRBH ON 61°C, speed (rpm) fan S1.
- Switch off ventilation system TRBH ON 60°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 CHF channel and to the FAN 1 ON value.

E.g. programming of the threshold FAN1 ON 70°C, the fan speed will progressively increase in relation to the temperature detected on the individual channel, see table example speed CH1.

table example speed CH1

Temperature CH1	Motor S and Rpm Speed	Fan flow rate **m³/h**		
		TG180BH	TG360BH	TG500BH
60°C	S0 = OFF	OFF	OFF	OFF
61°C	S1 = 1500	220	430	507
62°C	S2 = 1650	245	455	567
63°C	S3 = 1780	265	535	617
64°C	S4 = 1925	295	580	650
65°C	S5 = 2075	335	630	710
66°C	S6 = 2220	370	700	775
67°C	S7 = 2365	390	750	850
68°C	S8 = 2500	410	795	890
69°C	S9 = 2650	430	850	960
70°C	S10/full Speed = 2800 rpm	450	880	1000

NOTE: The speed regulation on the installed fans, with reference CH2 and CH3, will be managed in relation to the temperature increase on the relative channel (selections B2-M3 and B1-M3).

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 fans installed, the TRBH system provides for the possibility of programming the number of connected bars (B1 - B2) and the number of fans on the single bar using the thermometric control unit.

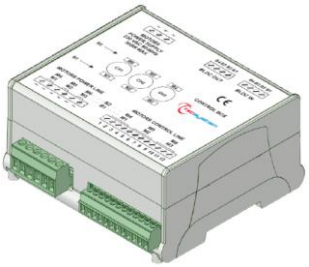
SYSTEM COMPONENTS

Temperature control unit versions:

- NT935BH-D
- NT935BH-ETH

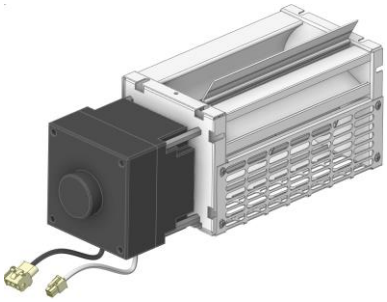
Control box CB3-BH

- B1 management bar 1 (M1-M2-M3)
- B2 management bar 2 (M4-M5-M6)

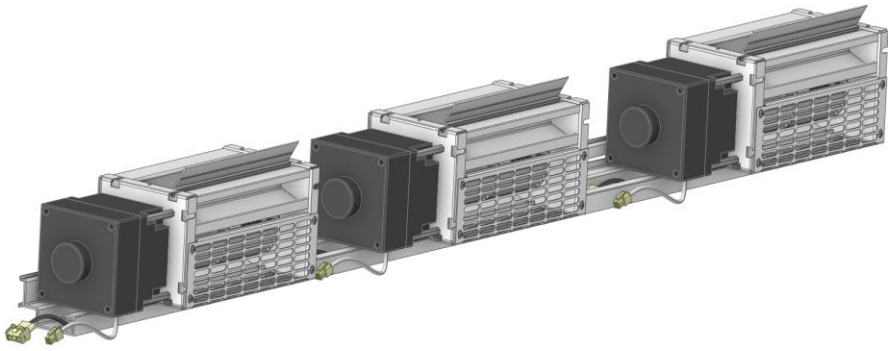


Fans

- TG180BH
- TG360BH
- TG500BH

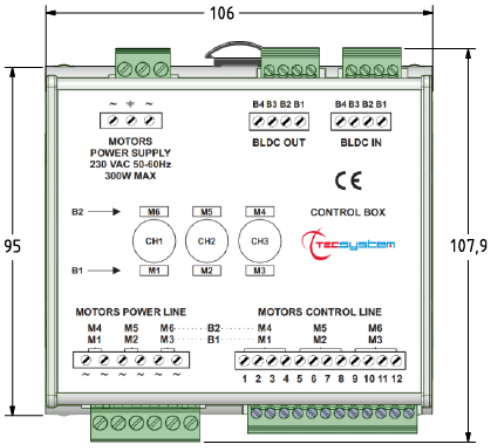


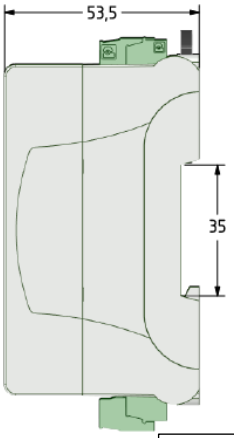
BH bar



CONTROL BOX CB3-BH ASSEMBLY

Control Box device dimensions





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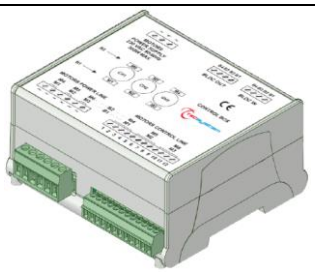
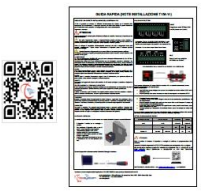
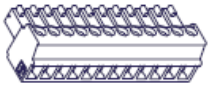
Attach the device to the DIN rail and make the connections to the removable terminal blocks.

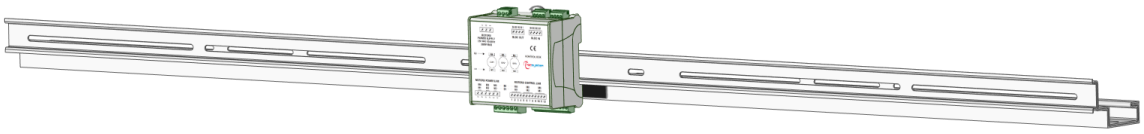
The following components are available for each control box:

Control box CB3-BH cod: 1AC0078	
Quick start guide and QR code	
Bar identification labels B1 - B2	
1 Terminal 3 poles pitch 5 supply Code: 2PL0367 - Screws tightening torque 0.5Nm	
2 Terminals 3 poles pitch 3.81 control box IN/OUT Code: 2PL0366 - Screws tightening torque 0.25Nm	
1 Terminal 12 poles pitch 3.81 motor control line Code: 2PL0420 - Screws tightening torque 0.25Nm	
1 Terminal 6 poles pitch 5 motor power line Code: 2PL0372 - Screw tightening torque 0.5Nm	

ATTENTION: always install the device using the terminals included in the pack.
The use of terminals other than those included in the control unit could cause malfunctions.

BAR AND FANS ASSEMBLY

Position the two profiles on the sides of the transformer (BAR 1-BAR 2).



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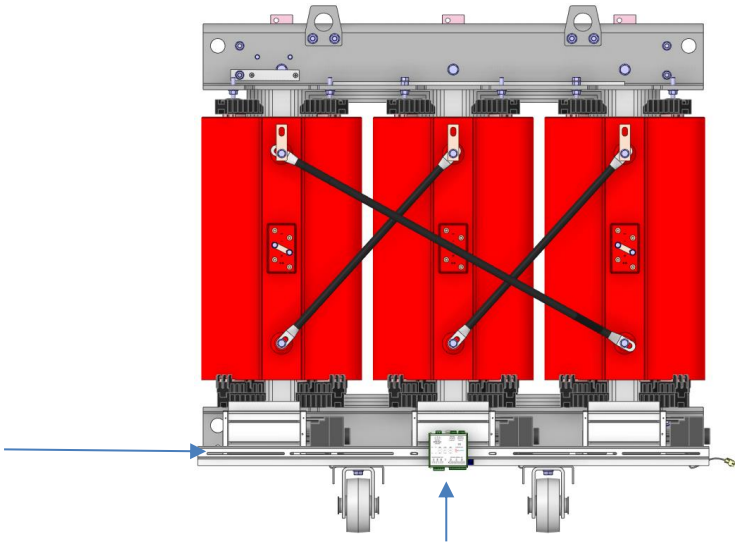
Prepare the bar on the transformer trolley and centre the positioning of the bar using the central column of the transformer as a reference.



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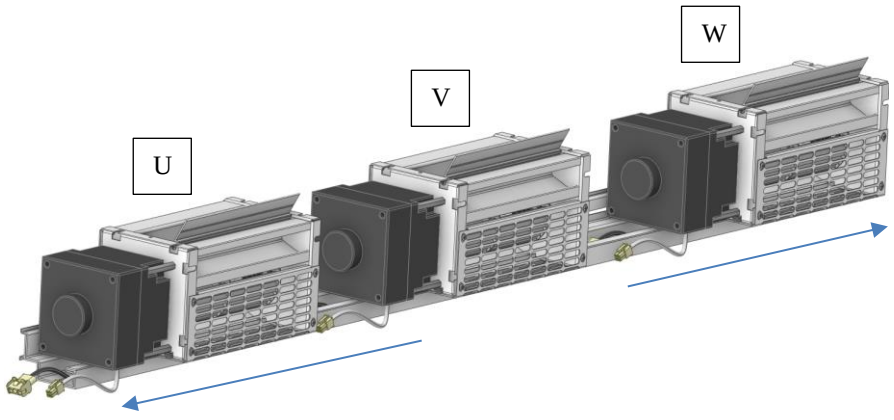
Fix the bar on the transformer trolley using the appropriate fixing slots, suggested M8 bolts plus washer, it may be necessary to momentarily remove one or more fans to properly secure the bar.

Position the fans on the bar, centre each individual fan with the U-V-W reference column.



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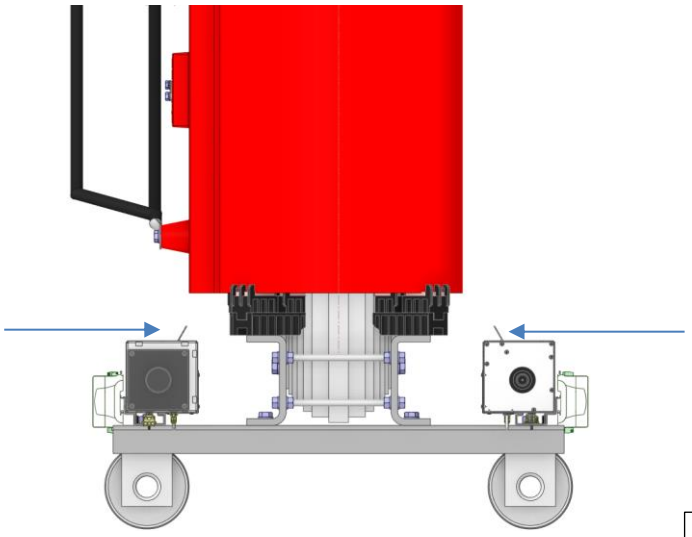
Use the dedicated slots on the bar and the self-drilling screws, supplied, to lock the fans in the desired position.



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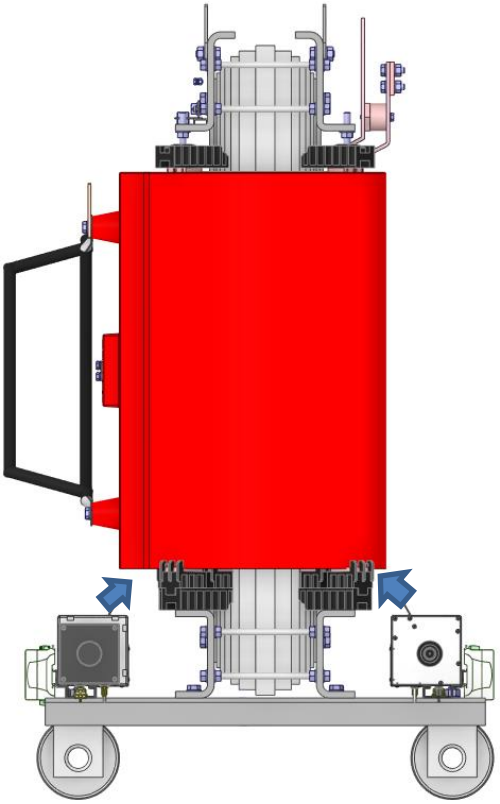
Use the fan flappers to correctly direct the air inside the transformer columns.

Air flow direction inside the transformer



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ATTENTION: always maintain a safe distance from the windings, indicated by the transformer manufacturer.

ASSEMBLY NOTES

Fix the fans on the bar using the dedicated holes on the back. Do not modify the fan fixing holes.
During fan movement, avoid deforming the impeller fins. Never change the position of the motor.
If the fan/bar is mounted on a transformer the fan's working position must
respect the safety distance indicated in the manual of the transformer on which you are installing the fan. The fan must be positioned in a horizontal plane; always check, with the help of a spirit level, that the fan is positioned correctly.

The maximum level of vibration permitted 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 fans, 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 fan could be the cause of faults. The installation of the fans 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 bars connected (B1 - B2) and the number of fans on the single bar. The following configurations BARS - FANS can be selected:

1) **B1-M1**/1 bar (B1) 1 fan (M1) connected
HOT speed regulation reference channel (the hottest channel of CH1-CH2-CH3)

2) **B1-M2**/1 bar (B1) 2 fans connected (M1-M2)
Reference channel for HOT speed regulation (the hottest channel of CH1-CH2-CH3)

3) **B1-M3**/1 bar (B1) 3 fans connected (M1-M2-M3)
Single speed regulation reference channel CH1 (M1) CH2 (M2) CH3 (M3)

4) **B2-M1**/2 bars (B1-B2) 2 fans connected (M1-M6)
Reference channel for HOT speed regulation (the hottest channel of CH1-CH2-CH3)

5) **B2-M2**/2 bars (B1-B2) 4 connected fans (M1-M2-M5-M6)
Reference channel for HOT speed regulation (the hottest channel of CH1-CH2-CH3)

6) **B2-M3**/2 bars (B1-B2) 6 fans connected (M1-M2-M3-M4-M5-M6)
Reference channel for selection single speed regulation CH1 (M1-M6) CH2 (M2-M5) CH3 (M3-M6)

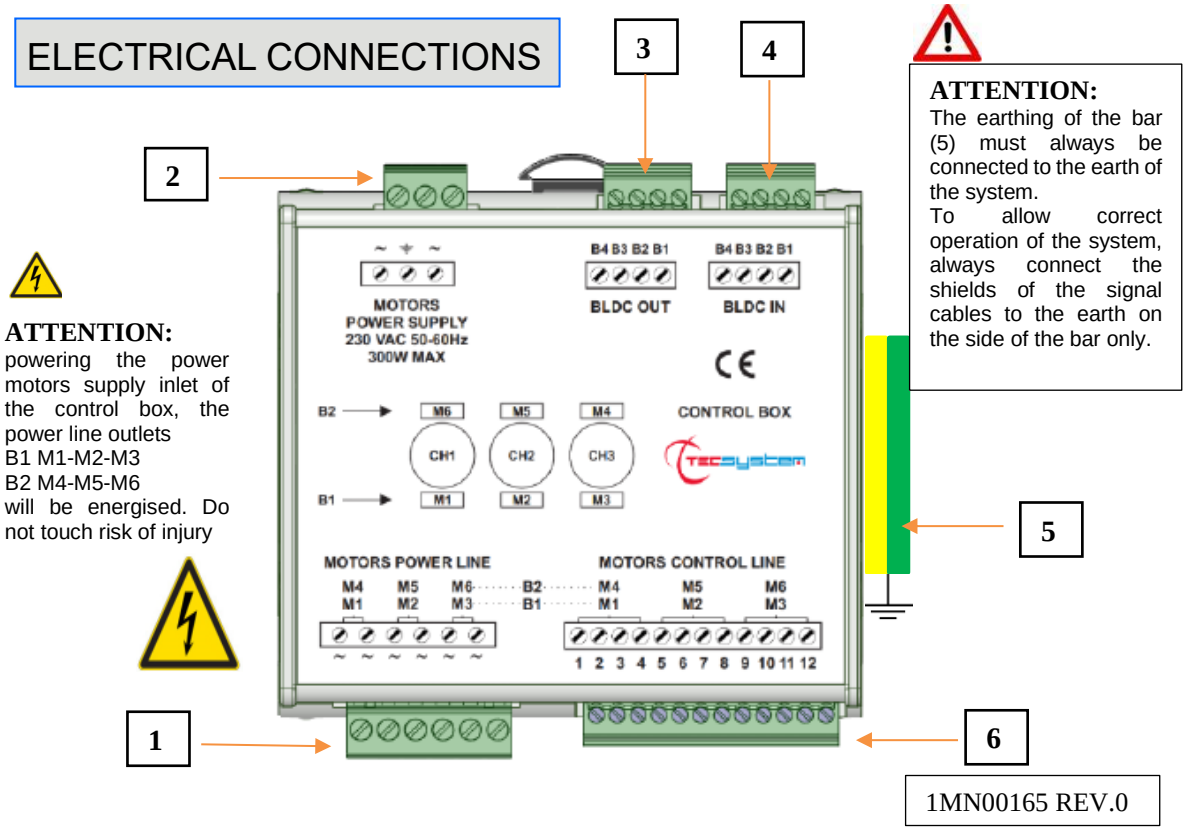
NOTE: the fan speed adjustment (rpm), with sections other than B1-M3 and B2-M3, is managed with HOT reference channel or the hottest channel of CH1-CH2-CH3.

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.

E.g. **B1-1 =** 1 bar B1 (only control box B1) and 1 fan connected M1 (only fan M1 connected).

Make the connections between the control unit and box (B1) and between the box (B1) and the M1 fan.

ELECTRICAL CONNECTIONS



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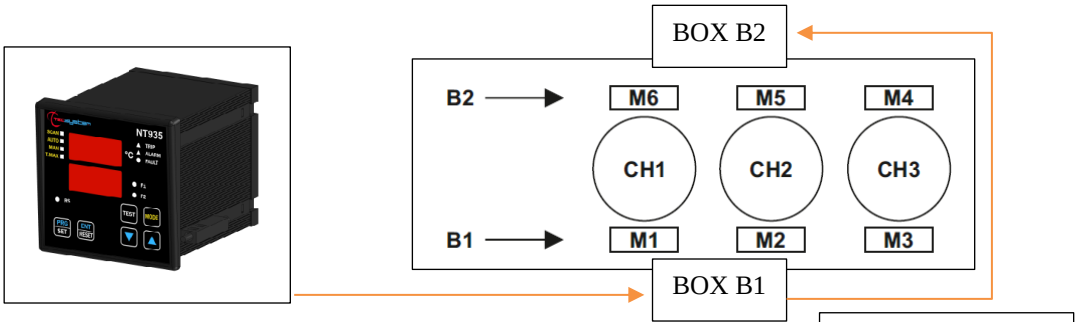
1)	Power supply 230 VAC 50/60Hz fans M1-M2-M3 (M4-M5-M6)	4)	Digital connection INPUT control unit BH and control box power supply
2)	Power supply 230 Vac 50/60 Hz fan line	5)	Bar ⏚ earthing.
3)	Digital connection OUTPUT control box 2 BLDC bar.	6)	Digital connection of M1-M2-M3 fans (M4-M5-M6).

ATTENTION: Before making the electrical connections on the control boxes it is advisable to identify the two bars with CONTROL BOX BAR B1 and CONTROL BOX BAR B2, using the supplied labels.
The identification of the two bars will be used to define the connections of the two boxes and of the fans (M1-M2-M3-M4-M5-M6) associated with the channels CH1-CH2-CH3.



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CONTROL BOX POWER SUPPLY

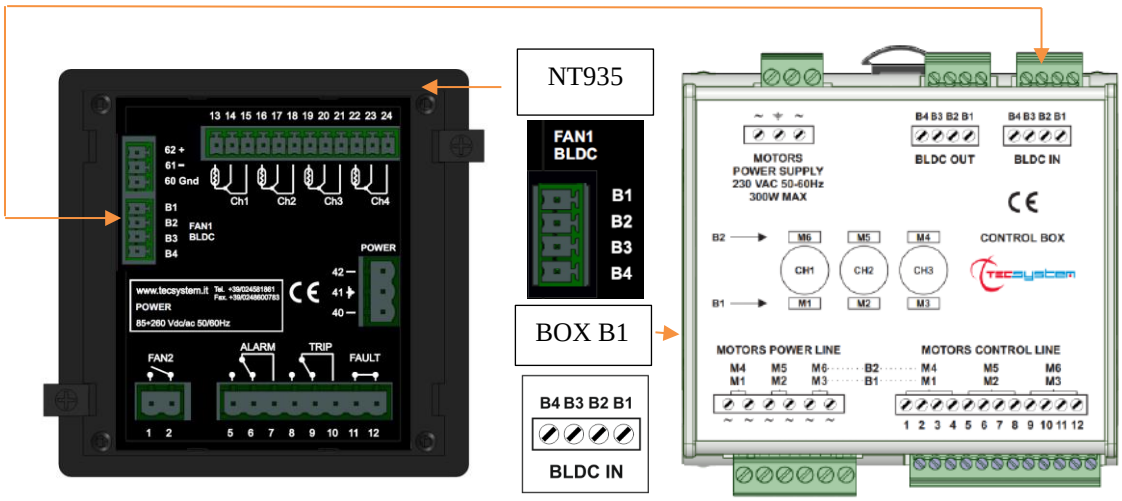
The control box has two dedicated power supplies:

- 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 B1 thermometer control unit and from the B1 control box to the B2 bar control box, see connections, control unit - control box B1 and control box B1 - control box B2 reported below.
- Power supply for 230Vac 50/60Hz motors, it is used to power the B1 M1-M2-M3 box fans or the B2 M4-M5-M6 box fans. 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 UNIT - CONTROL BOX B1

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



ELECTRICAL CONNECTIONS CONTROL BOX B1 - CONTROL BOX

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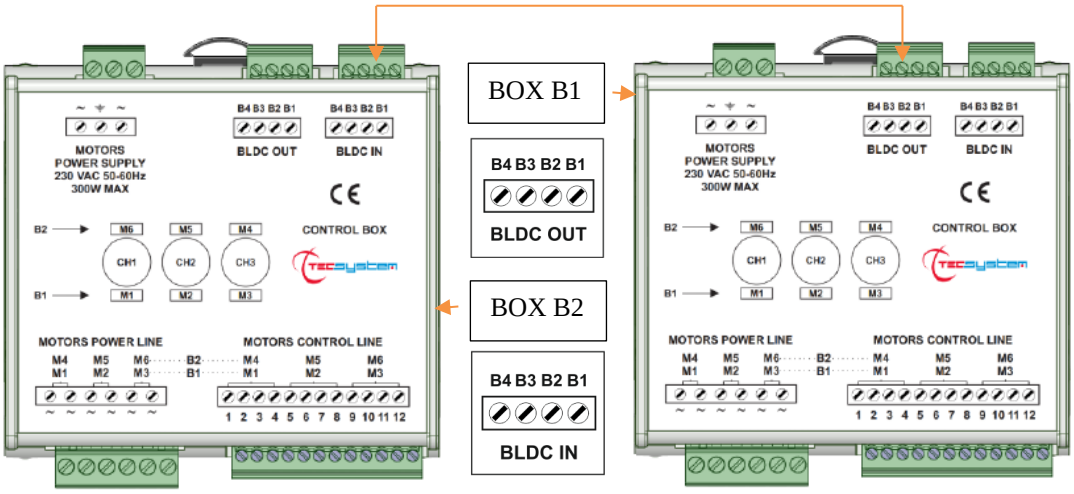
The electrical connection between control box B1 and control box B2 must be performed between: output OUT (B1-B2-B3-B4) of control box B1 and input IN control box B2 (B1-B2-B3- B4).

NOTE: connection only available in configurations with two bars B1 and B2 (**B2-1- B2-2- B2-3).**



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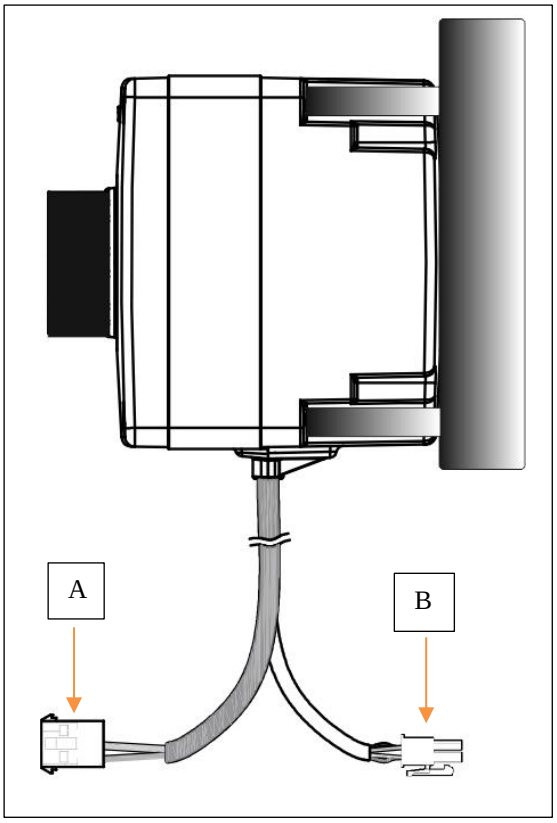
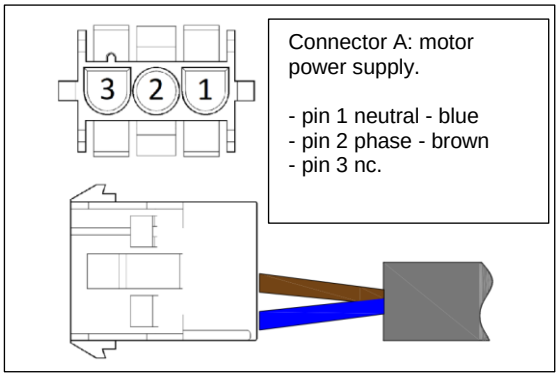
ELECTRICAL CONNECTIONS CONTROL BOX - BH FANS

The TG180BH-TG360BH-TG500BH motors have 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.



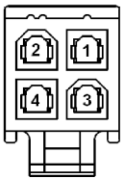


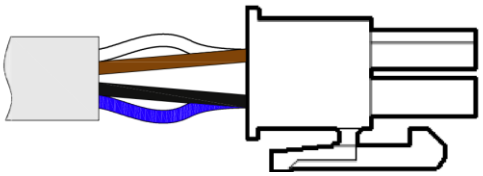
Connector A: motor power supply.

- pin 1 neutral - blue
- pin 2 phase - brown
- pin 3 nc.

Connector B: digital signals for motor signals.

- pin 1 - white
- pin 2 - brown
- pin 3 - blue
- pin 4 - black



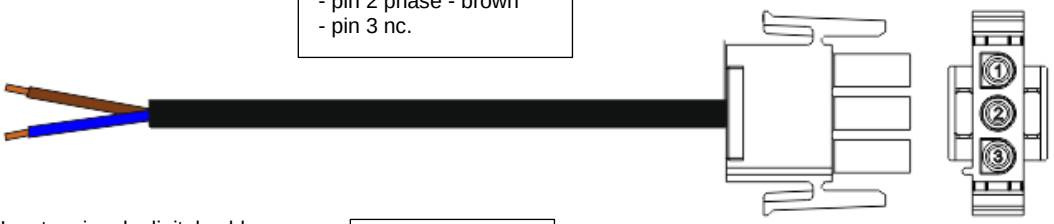


1MN0181 REV.0

The connections between the control box and the individual fans must be made using the cables supplied with the universal bar. Fan power cable and digital cable motor signals.

Motor power cable

- pin 1 neutral - blue
- pin 2 phase - brown
- pin 3 nc.



BH motor signals digital cable

- pin 1 - white
- pin 2 - brown
- pin 3 - blue
- pin 4 - black

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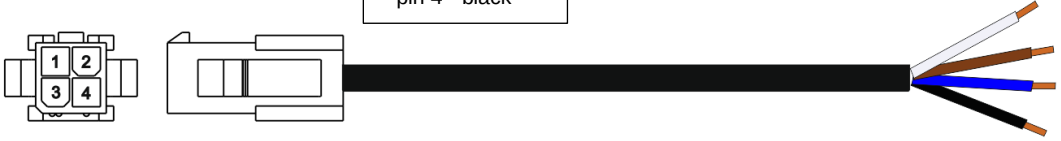
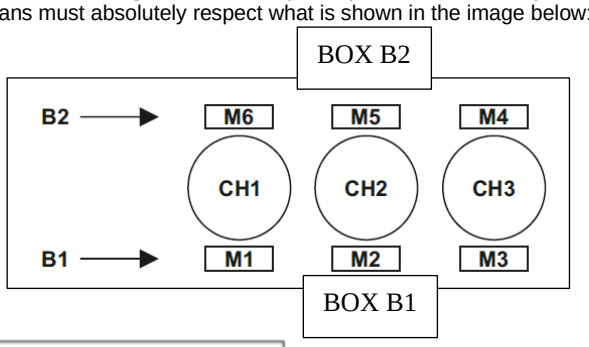


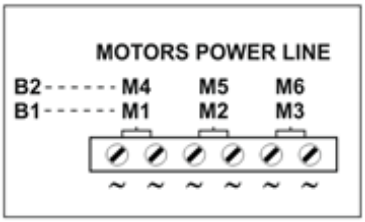
NOTE: depending on the bar purchased, it is possible to request the cable kit 1200BH-1800BH-3600BH.

The electrical connections of the two bars B1 and B2 depend on the configuration of the TRBH system selected (programmed on the thermometric control unit).

1) In the **B2-M3** configuration, 2 bars (B1-B2) 6 fans connected (M1-M2-M3-M4-M5-M6), the positioning and connection of the fans must absolutely respect what is shown in the image below:



ATTENTION: incorrect positioning or connection of the fans could result in anomalies in operation of the TRBH system.



Connect the motor connector A, of the single fan, with the relative motor power cable to the MOTORS POWER LINE output of the control box.

B1 bar motor power supply

M1	M2	M3
~ Brown ~ Blue	~ Brown ~ Blue	~ Brown ~ Blue

B2 bar motor power supply

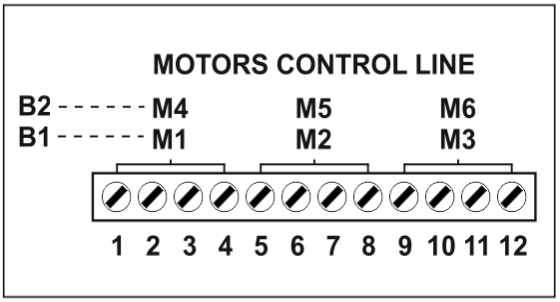
M4	M5	M6
~ Brown ~ Blue	~ Brown ~ Blue	~ Brown ~ Blue

After making all the connections of the individual fans, connect the 230Vac 50/60Hz fan lines to the **MOTORS POWER SUPPLY** input of both control boxes **(B1-B2)** .

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

B1 bar digital connection:

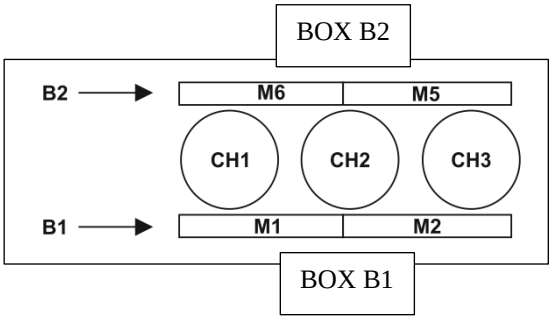
M1	M2	M3
1 White 2 Brown 3 Blue 4 Black	5 White 6 Brown 7 Blue 8 Black	9 White 10 Brown 11 Blue 12 Black



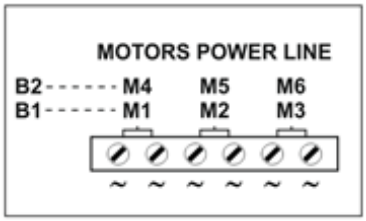
B2 bar digital connection:

M4	M5	M6
1 White 2 Brown 3 Blue 4 Black	5 White 6 Brown 7 Blue 8 Black	9 White 10 Brown 11 Blue 12 Black

2) In the **B2-M2** configuration, 2 bars (B1-B2) + 4 connected fans (M1-M2-M5-M6), the positioning and connection of the fans must absolutely respect what is shown in the image below:



ATTENTION: incorrect positioning or connection of the fans result in anomalies in operation of the TRBH system.



Connect the motor connector A, of the single fan, with the relative motor power cable to the MOTORS POWER LINE output of the control box.

B1 bar motor power supply

M1	M2
~ Brown ~ Blue	~ Brown ~ Blue

B2 bar motor power supply

M5	M6
~ Brown ~ Blue	~ Brown ~ Blue

After making all the connections of the individual fans, connect the 230Vac 50/60Hz fan lines to the **MOTORS POWER SUPPLY** input of both control boxes **(B1-B2)** .

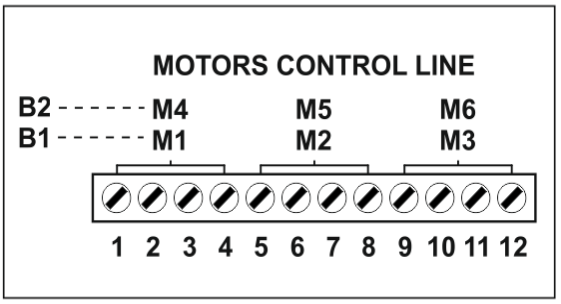
Connect the B motor connector of the single fan, with the relative digital cable motor signals to the MOTORS CONTROL LINE output of the control box.

B1 bar digital connection:

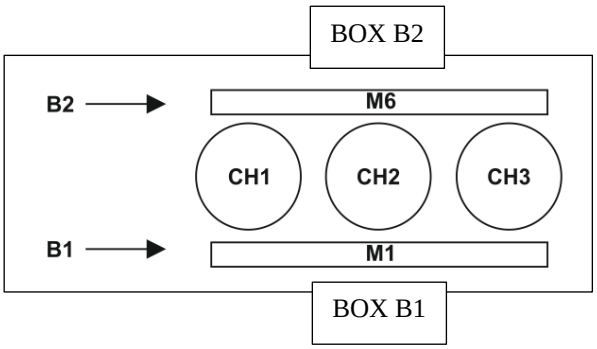
M1	M2
1 White 2 Brown 3 Blue 4 Black	5 White 6 Brown 7 Blue 8 Black

B2 bar digital connection:

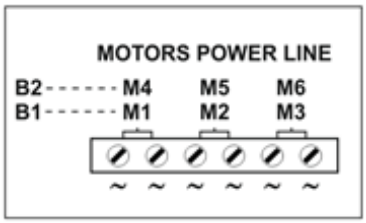
M5	M6
5 White 6 Brown 7 Blue 8 Black	9 White 10 Brown 11 Blue 12 Black



3) In the **B2-M1** configuration, 2 bars (B1-B2) + 2 connected fans (M1-M6), the positioning and connection of the fans must absolutely respect what is shown in the image below:



ATTENTION: incorrect positioning or connection of the fans result in anomalies in operation of the TRBH system.



Connect the motor connector A, of the single fan, with the relative motor power cable to the MOTORS POWER LINE output of the control box.

B1 bar motor power supply

M1
~ Brown ~ Blue

B2 bar motor power supply

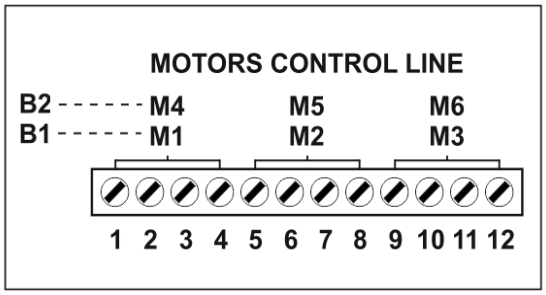
M6
~ Brown ~ Blue

After making all the connections of the individual fans, connect the 230Vac 50/60Hz fan lines to the **MOTORS POWER SUPPLY** input **of both control boxes (B1-B2)**.

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

B1 bar digital connection:

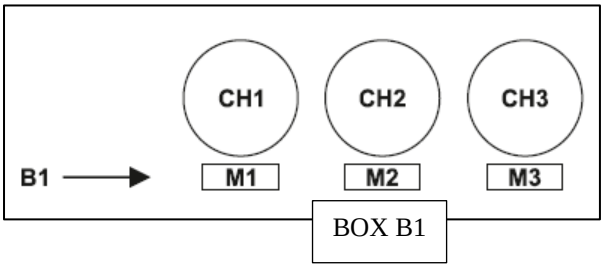
M1
1 White
2 Brown
3 Blue
4 Black



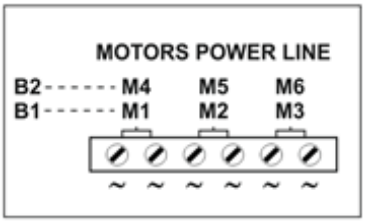
B2 bar digital connection:

M6
9 White
10 Brown
11 Blue
12 Black

4) In configuration **B1-M3**, 1 bar (B1) + 3 fans connected (M1-M2-M3), the positioning and connection of the fans must absolutely respect what is shown in the image below:



ATTENTION: incorrect positioning or connection of the fans result in anomalies in operation of the TRBH system.



Connect the motor connector A, of the single fan, with the relative motor power cable to the MOTORS POWER LINE output of the control box.

B1 bar motor power supply

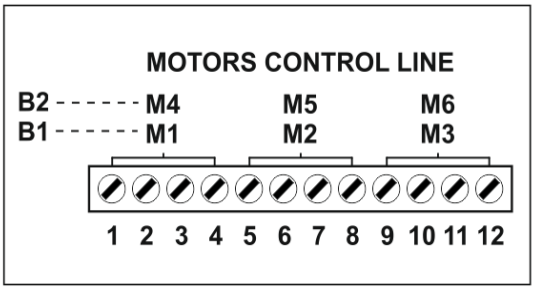
M1	M2	M3
~ Brown ~ Blue	~ Brown ~ Blue	~ Brown ~ Blue

After making all the connections of the individual fans, connect on the **MOTORS POWER SUPPLY** input of the B1 bar supply 230Vac 50/60Hz fan lines.

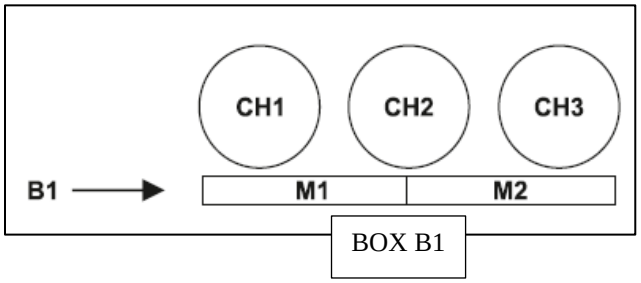
Connect the B motor connector of the single fan, with the relative digital cable motor signals to the MOTORS CONTROL LINE output of the control box.

B1 bar digital connection:

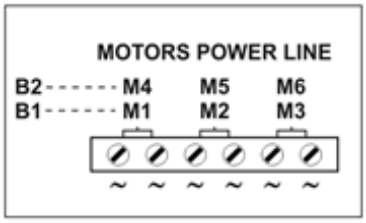
M1	M2	M3
1 White 2 Brown 3 Blue 4 Black	5 White 6 Brown 7 Blue 8 Black	9 White 10 Brown 11 Blue 12 Black



5) In configuration **B1-M2**, 1 bar (B1) + 2 fans connected (M1-M2), the positioning and connection of the fans must absolutely respect what is shown in the image below:



ATTENTION: incorrect positioning or connection of the fans result in anomalies in operation of the TRBH system.



Connect the motor connector A, of the single fan, with the relative motor power cable to the MOTORS POWER LINE output of the control box.

B1 bar motor power supply

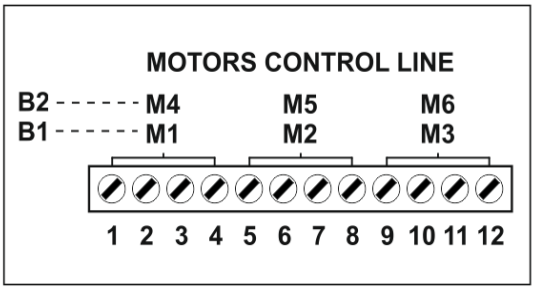
M1	M2
~ Brown ~ Blue	~ Brown ~ Blue

After making all the connections of the individual fans, connect the 230Vac 50/60Hz fan lines to the **MOTORS POWER SUPPLY** input **of both control boxes (B1-B2)** .

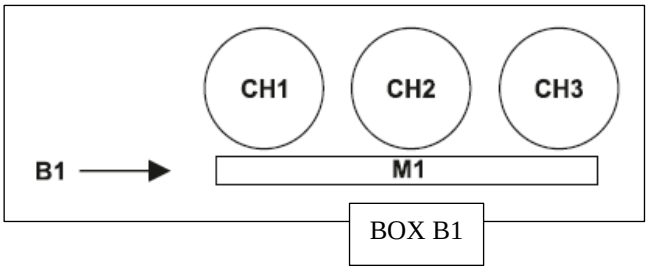
Connect the B motor connector of the single fan, with the relative digital cable motor signals to the MOTORS CONTROL LINE output of the control box.

B1 bar digital connection:

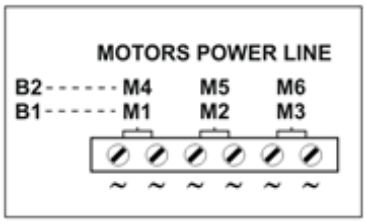
M1	M2
1 White 2 Brown 3 Blue 4 Black	5 White 6 Brown 7 Blue 8 Black



6) In configuration **B1-M1**, 1 bar (B1) + 1 fan connected (M1), the positioning and connection of the fan must absolutely respect what is shown in the image below:



ATTENTION: incorrect positioning or connection of the fans result in anomalies in operation of the TRBH system.



Connect the motor connector A, of the single fan, with the relative motor power cable to the MOTORS POWER LINE output of the control box.

B1 bar motor power supply

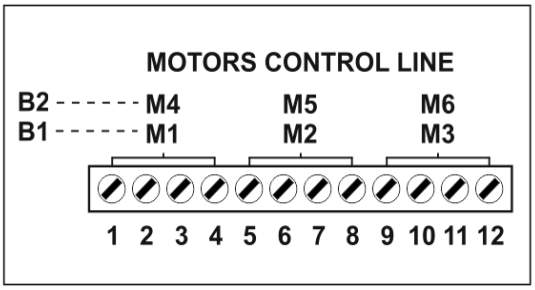
M1
~ Brown
~ Blue

After making all the connections of the individual fans, connect the 230Vac 50/60Hz fan lines to the **MOTORS POWER SUPPLY** input **of both control boxes (B1-B2)** .

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.

B1 bar digital connection:

M1
1 White
2 Brown
3 Blue
4 Black



NOTES: DIGITAL SIGNAL CONNECTIONS

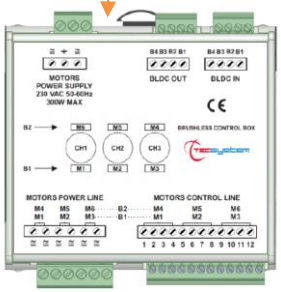
All signal transport cables, components of the TRBH system (connections between: temperature control unit, control box (B1), control Box (B2) and fans), must strictly respect the following rules:

- 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

TEST KEY



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 connected to the single bar.

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 BH bars (B1-B2), 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 RS1: communication failure with the B1 control box
FLT RS2: communication failure with the B2 control box
FLT B1: failure of at least one motor on the B1 bar
FLT B2: failure of at least one motor on the bar B2
FLT B1-B2: failure of at least one motor on the B1 bar and on the B2 bar

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 (M1-M6) (M2-M5) (M3-M4)
- 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 B1 or B2 bars, 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.

TRBH REGISTERS NT935BH (D and ETH)

45		00	TRBH_1 speed	M1-M6 motors		R
46		00	TRBH_1 motor status 1/2 bars			R
49		00	TRBH_2 speed	M2-M5 motors		R
50		00	TRBH_2 motor status 1/2 bars			R
53		00	TRBH_3 speed	M3-M4 motors		R
54		00	TRBH_3 motor status 1/2 bars			R

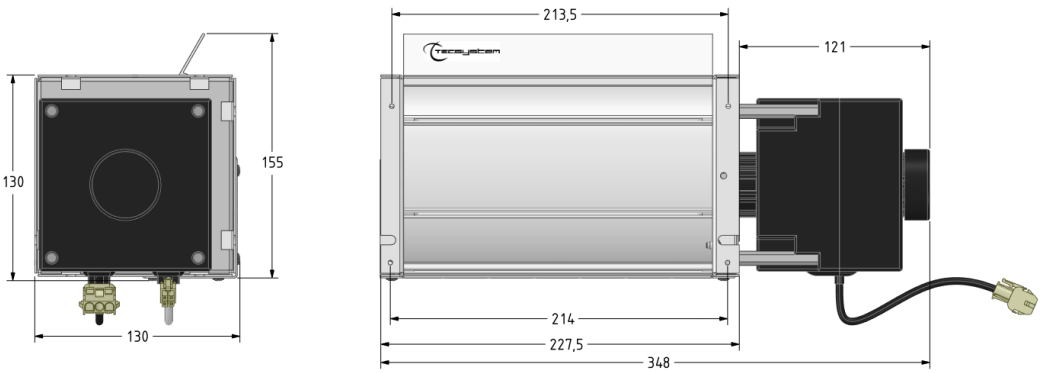
BH MOTOR STATUS

BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
--	--	--	--	Motor status Bar_2		Motor status Bar_1	

TRBH motor status: 00=OK
10=overtemperature
01=general motor fault
11= communication failure with the control box/bar

BH FANS DIMENSIONS

TG180BH



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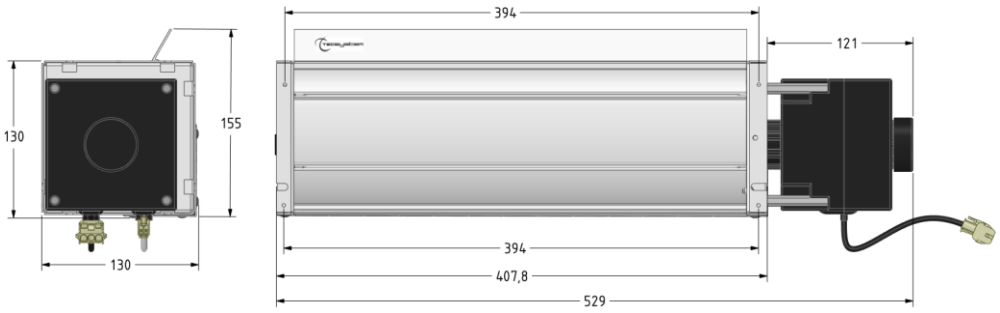
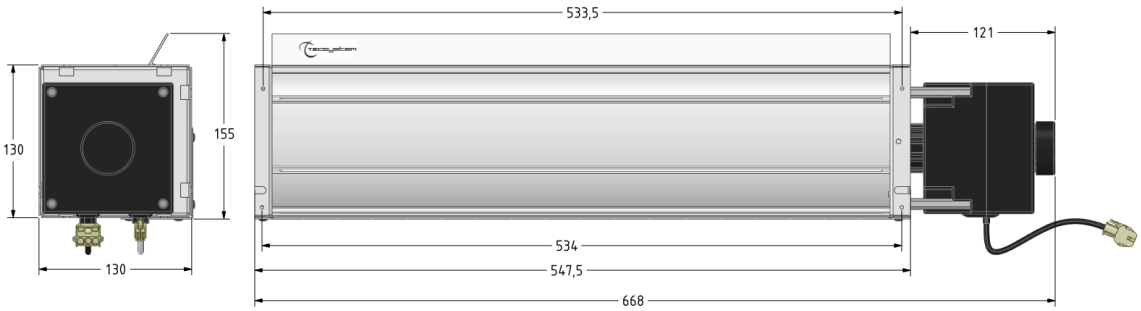
TG360BH



1MN0255 REV.0

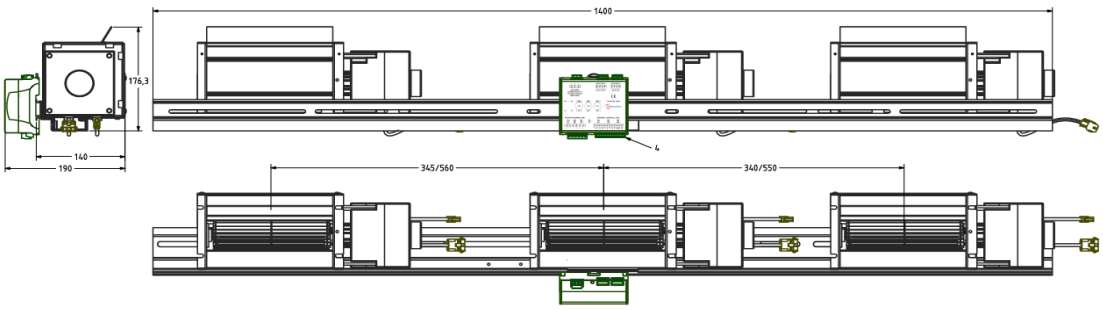
TG500BH



1MN0256 REV.0

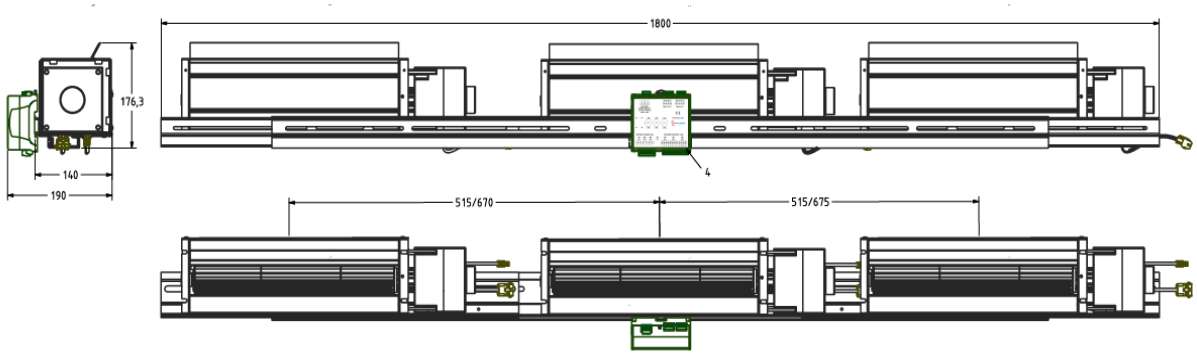
BH BAR DIMENSIONS

1200BH



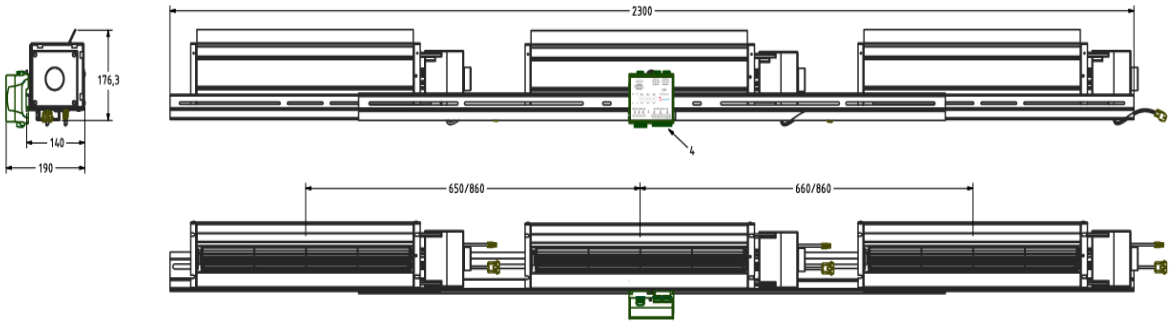
1MN0245 REV.0

1800BH



1MN0246 REV.0

3600BH



1MN0247 REV.0

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 www.tecsystem.it 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 RS1:** communication failure with the B1 control box.	Check the correct connection between the control unit and control box B1, see control unit - control box connections on page 14.
The control unit signals **FLT RS2:** communication failure with the B2 control box	Check the correct connection between control box B1 and control box B2, see control unit - control box connections on page 14.
The control unit signals **FLT B1:** failure of at least one motor on the B1 bar.	Check the correct operation of the fans installed on the B1 bar. Clean the fans using only compressed air.
The control unit signals **FLT B2:** failure of at least one motor on the bar B2.	Check the correct operation of the fans installed on the bar B2. Clean the fans using only compressed air.
The control unit signals **FLT B1-B2:** failure of at least one motor on the bar B1 and on the bar B2	Check the correct operation of the fans installed on the bars B1 and B2. 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