

# HEAT RECOVERY UNITS *Energy Plus* INSTALLATION, USE AND MAINTENANCE MANUAL



AND *T-EP* WALL CONTROL



 **SABIANA**  
IL CLIMA AMICO

A company of Arbonia Group  
**ARBONIA** ▲

Via Piave, 53 • 20011 Corbetta (MI) • ITALY  
Tel. +39.02.97203.1 ric. autom. • Fax +39.02.9777282 - +39.02.9772820  
E-mail: [info@sabiana.it](mailto:info@sabiana.it) • Internet: [www.sabiana.it](http://www.sabiana.it)

E 11/16  
A 11/16

Cod. 4051012EN

**INDEX**

Fundamental safety rules	page 3
Use and preservation of the manual	page 5
Safety standards and "CE" logo	page 6
General information	page 6
Provisions for maintenance	page 6
Other risks	page 6
Warning and danger labels	page 6
Identification labels	page 7
General warnings	page 7
Operating limits	page 8
Waste disposal	page 8
Receipt of the unit, handling and start	page 9
Characteristic technical data	page 10
Overall dimensions of the packaged unit	page 10
Dimension and weight	page 11
Layout of the unit	page 12
Ceiling installation	page 12
Floor installation	page 13
Air Duct Connections	page 13
Inverting the air flows	page 13
Inverting the air flows of ceiling units	page 14
Inverting the air flows of floor units	page 15
ENY-P1 airflow performance	page 16
ENY-P2 airflow performance	page 17
ENY-P3 airflow performance	page 18
ENY-P4 airflow performance	page 19
Thermal performance	page 20
Main operating logic	page 21
Electrical panel	page 22
BEP electric antifreeze coil	page 26
BER electric post-heating coil	page 29
Water coil	page 32
Auxiliary sections	page 34
CO <sub>2</sub> sensor	page 38
Condensate drain siphon	page 38
Maintenance	page 39
Troubleshooting	page 41
T-EP wall control	page 42
Declaration of conformity	page 60



Carefully **read the following user information manual** before starting up the machine.



Warning!  
Particularly important and/or delicate operations.



Operations which may be carried out by the user.



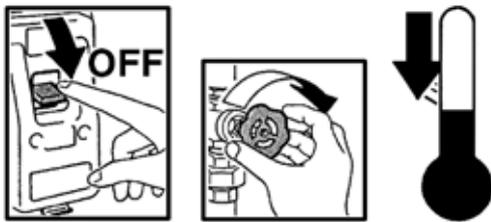
Interventions to be carried out **exclusively by an installer or authorized technician.**

## FUNDAMENTAL SAFETY RULES



- The unit must never be used by children or unfit persons without supervision.
- This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.
- It is dangerous to touch the unit with damp parts of the body and bare feet.
- Never tamper or modify regulation and safety devices without prior authorisation and instructions.
- Never twist, detach or pull power cables, even when the unit is unplugged from the mains power supply.
- Neither throw nor spray water on the unit.
- Never introduce foreign objects through the air intake and discharge grids.
- Never remove protective elements without first unplugging the unit from the mains power supply.
- Do not throw packaging material away or leave it with in reach of children as it may represent a hazard.
- Do not install in explosive, corrosive or damp environments, outdoors or in very dusty rooms.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance.
- Cleaning and user maintenance shall not be made by children without supervision.

- Before carrying out any operation on the appliance, make sure:
  - 1 - The unit is disconnected from the electrical power supply.
  - 2 - The coil water supply valve is closed and the coil has cooled down.
  - 3 - Install a safety switch to turn off current to the appliance in an easily accessible position near the unit or units.

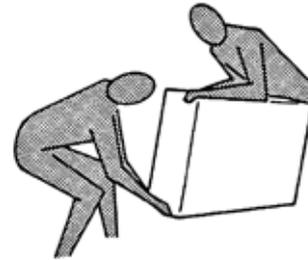


- During installation, maintenance and repairs, for safety reasons, observe the following precautions:
  - Always use work gloves.
  - Do not expose to inflammable gas.
  - Do not place objects over the grids.

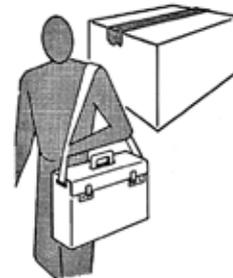


- Make sure the unit is earthed.

- When moving the appliance, lift it by yourself (for weights of under 30 kg) or with the help of another person.
- Lift it slowly, taking care not to drop it.



- Never introduce objects or the hand into the fans.
- Do not remove the safety labels inside the appliance.
- If you cannot read the labels, ask for replacements.
- Always use original spare parts.



## USE AND PRESERVATION OF THE MANUAL

- This instruction manual is intended for the machine's user, the owner and installation technician and must always be available to be consulted, if necessary.
- The manual is addressed to the maintenance and installation operators of the machine.
- The instruction manual aims to describe how to use the machine the way the machine is designed to be used, the machine's technical features and to provide information on how to use the machine correctly, and how to clean, control and operate the machine; in addition, the manual provides important information about maintenance, any residual risks and however how to carry out operations to be performed with special care.
- This manual is to be considered a part of the machine and must be **PRESERVED FOR FUTURE REFERENCE** until the machine is finally dismantled.
- The instruction manual must always be available for consultation and be preserved in a protected and dry place.
- The user can request a new manual from the manufacturer or from the local retailer if the manual is lost or damaged. The request must include details of the machine model and the serial number indicated on the identifying data plate.
- This manual reflects the technical features at the date of preparation; the manufacturer reserves the right to upgrade the production and the subsequent manuals without being under an obligation to also update previous versions.
- The manufacturer accepts no liability in the following cases:
  - improper or incorrect use of the unit;
  - use that does not comply with the information expressly specified in this publication;
  - serious shortcomings in the foreseen and recommended maintenance operations;
  - changes made to the machine or any unauthorised operation;
  - using non-genuine spare parts or parts not specific to the model;
  - total or even partial non-compliance with the instructions;
  - exceptional events.

## SAFETY STANDARDS AND CE LOGO

In line with our policy of ongoing improvement, we always aim to provide state-of-the-art products compliant with current safety standards. The rules and guidelines in this document, therefore, reflect compliance with the safety regulations and provisions that apply. In addition to following the recommendations in this document, all staff potentially exposed to risks during the installation, use or maintenance of our equipment are strongly recommended to ensure that it complies with the relevant domestic safety regulations in force. The CE marking and Declaration of conformity provided attest to the compliance of our products with the applicable Community legislation.

However, SABIANA declines all liability for personal injury or damage to property caused by the failure to apply these safety regulations or by unauthorised modification of the product. When installation involves other products without CE marking, the relevant certification rests with the purchaser, who assumes full responsibility for the certification of conformity of the entire system.

The products are manufactured in accordance with the following guidelines:

- **Machinery directive 2006/42/EC**  
**Low Voltage Directive 2014/35/EU**
- **Electromagnetic compatibility directive 2014/30/EU**

## GENERAL INFORMATION

Please do not remove the safety devices. However, if you need to remove a device (for good reason), you should take immediate measures to prevent possible hazards. In addition, it is strongly recommended that you reinstall the protective device removed as soon as possible. All (ordinary and extraordinary) maintenance procedures must always be performed with the product isolated from the power supply. To minimise the risk of accidental starting of a fan/motor during maintenance, it is recommended that you place a suitable warning sign on the control panels/control boards, e.g. **“Attention: Verify that the power supply is disconnected before performing any maintenance”**. Also, before you connect a power cable to a terminal block, check that the line voltage corresponds to that indicated on the product label. If the product labels become illegible over time, please replace them.

### **WARNING!**

*All the internal wiring is located under the top panel of the unit. For this reason, it is not permitted to drill holes in the Panel. To do so would involve a risk of electric shock and damage to the unit. This also applies to the control panel and the area of the controls.*

## PROVISIONS FOR MAINTENANCE

The maintenance staff must observe all the accident prevention (safety) regulations in force. The following recommendations must be observed in particular:

- wear protective clothing and appropriate protective equipment to minimise the risk of accidents;
- make sure that a safety interlock has been activated to prevent unauthorised running of the machine.

## OTHER RISKS

Product-related risks were assessed as per the machinery directive 2006/42/EC. The manual associated with the directive contains information and advice for all the staff on how to minimise the risk of personal injury and damage to property.

## WARNING LABELS

There are various symbols or warning labels on the machine which must not be removed.



## DANGER LABELS

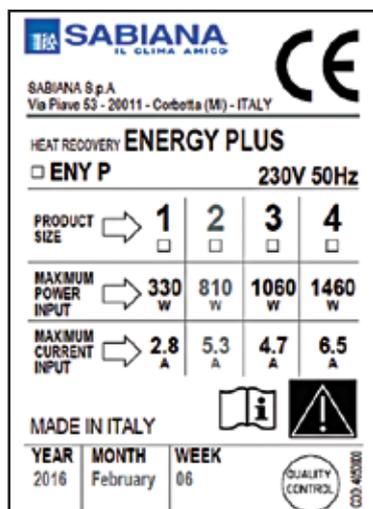
These draw attention to the presence of live parts inside the casing on which the label is applied.



## IDENTIFICATION LABELS

Serial number plate: gives details of the product and the manufacturer's address.

**NOTE:** other safety labels can be added to the product according to the analysis of additional risks / other risks.



## GENERAL WARNINGS

**A-weighted sound pressure level < 70 dB(A).**

What follows is extremely important with regard to: Handling, storage, installation, maintenance, operation, servicing of the electrical equipment, servicing of the refrigeration system:

- All the staff must be trained or instructed adequately.
- The responsibilities of the staff must be clearly defined.
- All work on the electrical equipment must be carried out by, or under the supervision of qualified electricians.
- All plumbing work must be performed by qualified installers or by staff trained for this purpose.

Assembly, disassembly, installation, work on the electrical system, commissioning and maintenance of the heat exchanger for installation in a false ceiling must be in accordance with the laws, rules, regulations, codes and health and safety standards in force, and combined with the latest technology. The wiring diagrams in this manual do not consider grounding or other electrical protection required by local rules, regulations, codes and standards or by the local electricity supplier.

## Scope and Qualifications

This User Information Manual addresses the following:

- Transportation, handling and storage
- Installation
- Electrical work
- Commissioning and maintenance
- Disposal

All repairs or maintenance must be performed by qualified specialists. The manufacturer declines all responsibility for damage caused by modifications or tampering with the unit.

**THIS BOOKLET IS AN INTEGRAL PART  
OF THE APPLIANCE  
AND MUST ALWAYS ACCOMPANY THE UNIT.**

## FUNDAMENTAL SAFETY RULES

Installation work, electrical work and repairs must be carried out by qualified skilled personnel who have adequate training and experience and are familiar with:

- safety and health rules and regulations;
- rules and regulations applicable to the prevention of accidents;
- applicable codes and standards.

Such skilled workers must be able to understand their work and to identify and avoid potential risks.

Transportation, handling, commissioning and maintenance may be carried out by skilled persons or persons who have been given the necessary training and instructions with respect to their work and the risks implied by unsafe working.

### **FOR THE INSTALLATION:**

Install a safety switch to turn off current to the appliance in an easily accessible position near the unit or units.

The space above the suspended ceiling must be dry and adequately protected against moisture and the ingress of humidity.

If the installation is fitted with an external air intake damper, make sure the coil tubes are not damaged by temperatures below freezing point.

During installation, for safety reasons, observe the following precautions:

- The unit must always be handled by two people.
- Lifting tackle and gear must have sufficient capacity.
- Defective lifting gear and tackle must not be used.
- Ropes, belts and similar lifting tackle must not be knotted or come into contact with sharp edges.
- Fork-lift trucks, elevating-platform trucks and cranes must have sufficient capacity.
- Loads must not be lifted over persons.
- Do not operate the fans until they have been connected to the air pipes.

And:

The operating pressure and the operating temperature must never exceed the rated pressure and temperature (see "Operating limits").

Air intakes and air discharge openings must never be obstructed or blocked!

Make sure that the fan has stopped.

Flow and return valves and any isolating valves must be closed for repair and maintenance.

Never tamper with or modify regulation and safety devices without prior authorisation and instructions.

If pipe connections of the heat exchanger are handled improperly, hot heating fluid may be discharged and may cause scalding.

All panels and covers removed for repair or maintenance work must be fitted back after the completion of work.

### **FOR THE USE:**

It is dangerous to touch the unit with damp parts of the body and bare feet.

In particularly cold climates, if the appliance is not to be used for long periods, drain the hydraulic circuit.

## OPERATING LIMITS

### **HEAT RECOVERY UNIT AND HEAT EXCHANGER:**

- Maximum temperature of heat vector fluid: max. 85°C
- Minimum temperature of refrigerant fluid: min. 6°C
- Maximum working pressure: 1000 kPa (10 bars)
- Power supply voltage: 230V - 50Hz
- Electric energy consumption: see technical data label
- Fan motor operating limit is at -20 / +40°C of entering air temperature

## WASTE DISPOSAL

The device contains recyclable materials and substances. It must not be disposed of with unsorted waste but separated, recovered and disposed of at specialised centres depending on the type of material:

- Sheets of galvanised steel or aluzinc: sandwich panels, fans, bulkheads, condensate drip trays, nozzles.
- Aluminium or aluminium alloy: heat exchanger, fins of the coil, bypass damper, motor parts.
- Copper: motor windings, coil.
- Polyurethane foam: insulation in the sandwich panels.
- Polyethylene: insulation in the separation panels.
- Electrical and electronic equipment: control board and circuit boards.

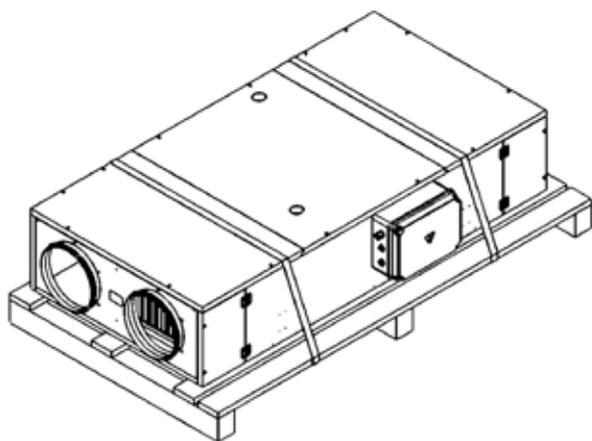
Consumables and replaced parts should be disposed of safely and in accordance with the environmental protection legislation.



## RECEIPT OF THE UNIT, HANDLING AND START

### RECEIPT OF THE UNIT

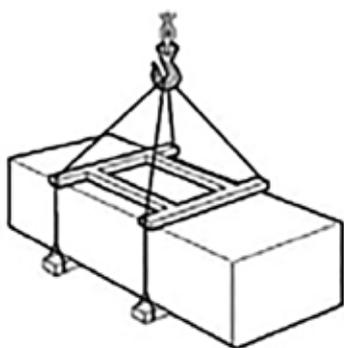
Each product is carefully inspected before shipment. Upon receipt of the goods, it is recommended that you check these for any signs of damage caused during transport. If there is any damage, report it to the carrier, who is held responsible for damage during transport. Typically, the product is packed for transport on pallets. A protective film is usually also applied to minimise water infiltration.



### HANDLING AND UNLOADING

Before unloading the products, ensure that the handling/lifting device is suited to the weight and size of the same. For products transported on pallets, it is recommended to use a forklift truck.

Lift the unit and put it in place with spacers, making sure the equipment is suited to the weight of the unit.



### STARTING THE UNIT

Before using the product, check the following:

- Verify that the input/output connections of the product are not obstructed.
- Check that all the components of the product are securely attached to their seals.
- Manually turn the impellers of each fan to ensure that they do not rub and do not stick against the shroud.
- Verify that all the inspection or access doors are closed.

#### **ATTENTION!**

*If the fan inlets or outlets are not connected to a ducted system, ensure that appropriate protections are installed before starting the unit. Check that the electrical connections have been made correctly, especially the grounding.*

#### **IMPORTANT!**

*The electrical connections must be made by qualified staff.*

### DISASSEMBLY AND REASSEMBLY

Before disassembly or reassembly, ensure the product is isolated from the power supply to prevent operation of the fans. Disassembly and reassembly must be carried out by qualified staff as they do not fall under routine maintenance.

## CHARACTERISTIC TECHNICAL DATA

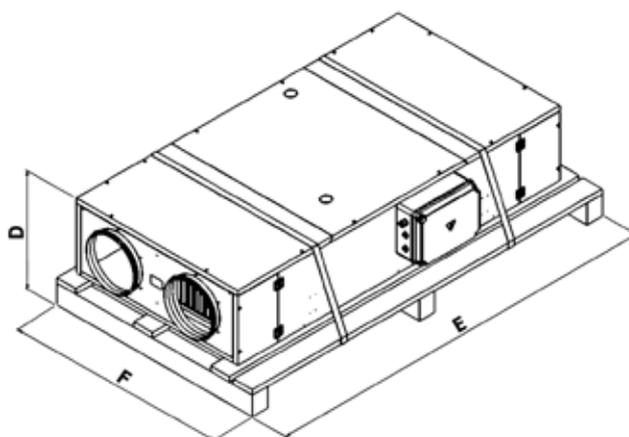
<b>MODEL</b>		<b>ENY-P1</b>	<b>ENY-P2</b>	<b>ENY-P3</b>	<b>ENY-P4</b>
Maximum supply and return air flow rate	m <sup>3</sup> /h	720	1150	1700	2600
	m <sup>3</sup> /s	0,20	0,32	0,47	0,72
Supply and return rated available static pressure	Pa	170	220	250	250
Minimum supply and return air flow rate	m <sup>3</sup> /h	270	300	600	690
Thermal efficiency EU regulation 1253/14 <sup>(1)</sup>	%	80	80	80	85
Total thermal output recovered <sup>(1)</sup>	kW	3,9	6,2	9,1	14,8
Maximum recovery efficiency <sup>(2)</sup>	%	90	90	90	94
Total thermal output recovered <sup>(2)</sup>	kW	6,5	10,5	15,4	24,5
Total number of fans	-	2	2	2	2
Rated absorbed electrical power <sup>(3)</sup>	W	330	770	1060	1460
Maximum total absorbed current <sup>(3)</sup>	A	2,8	3,4	4,7	6,5
Unit power supply <sup>(3)</sup>	V-Ph	230-1 + N / 50Hz			
Protection rating with machine installed	-	IP20	IP20	IP20	IP20
Unit weight	kg	90	140	170	320

1) Air conditions: TAE = 5°C and t<sub>i</sub> = 25°C, no condensate

2) Air conditions: TAE = -10°C and t<sub>i</sub> = 20°C, RH<sub>i</sub> 50% RH

3) Basic version

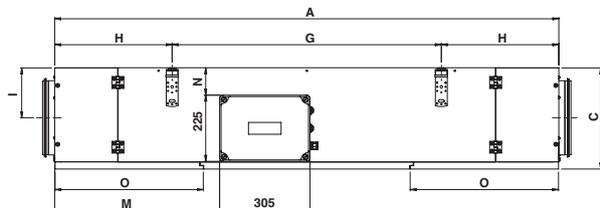
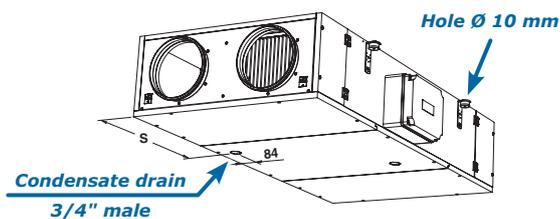
## OVERALL DIMENSIONS OF THE PACKAGED UNIT



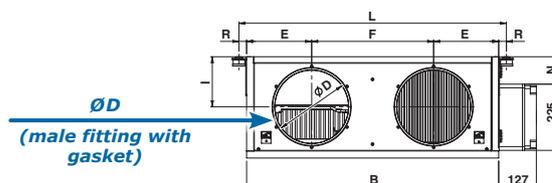
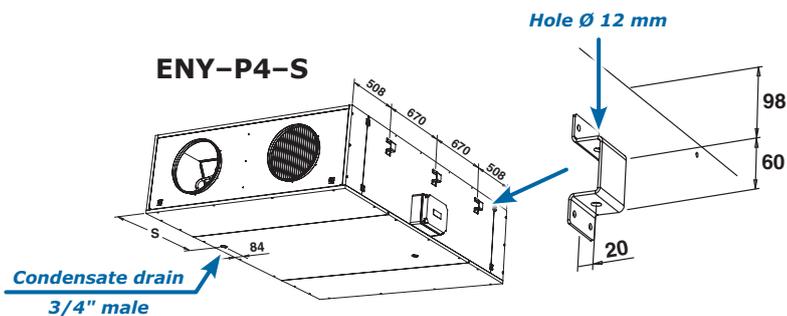
<b>MODEL</b>		<b>ENY-P1</b>	<b>ENY-P2</b>	<b>ENY-P3</b>	<b>ENY-P4</b>
Dimensions	<b>D</b> mm	469	510	595	735
	<b>E</b> mm	1845	1845	2245	2345
	<b>F</b> mm	1030	1030	1430	1880
Weight	kg	119	165	198	370

### Ceiling units

ENY-P1-S / ENY-P2-S / ENY-P3-S

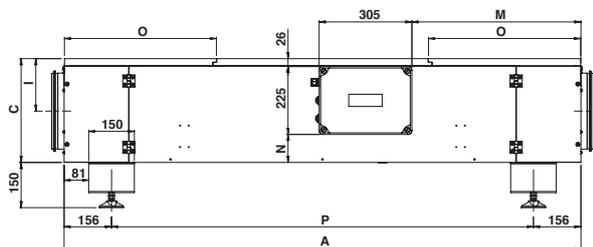
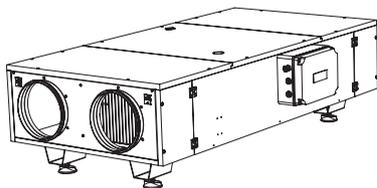


ENY-P4-S

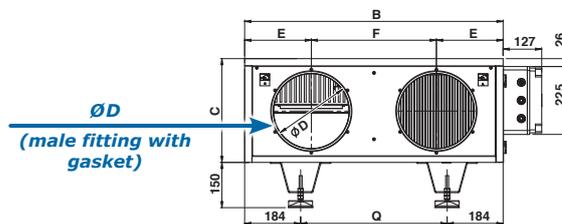
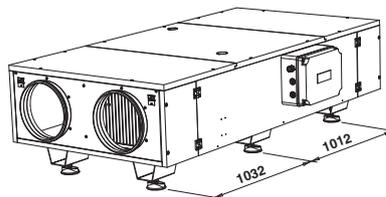


### Floor units

ENY-P1-P / ENY-P2-P / ENY-P3-P



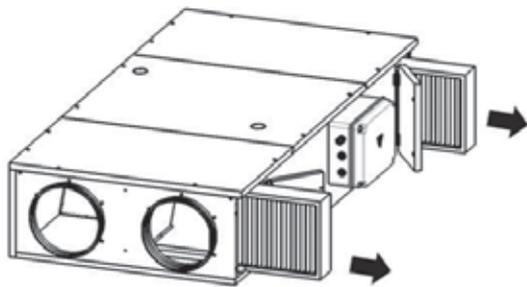
ENY-P4-P



MODEL		ENY-P1	ENY-P2	ENY-P3	ENY-P4	
Dimension	A	mm	1700	1750	2100	2355
	B	mm	850	1150	1250	1700
	C	mm	344	385	470	610
	ØD	mm	250	250	355	400
	E	mm	220	295	325	435
	F	mm	410	560	600	830
	G	mm	908	1108	1328	670 + 670
	H	mm	396	321	386	508
	I	mm	170	190	234	305
	L	mm	902	1202	1302	1740
	M	mm	556	581	758	885
	N	mm	93	134	219	359
	O	mm	500	500	580	580
	P	mm	1388	1438	1788	1032 + 1012
Q	mm	482	782	882	1332	
R	mm	26	26	26	20	
S	mm	654	678	791	856	
Weight	kg	98	140	170	325	

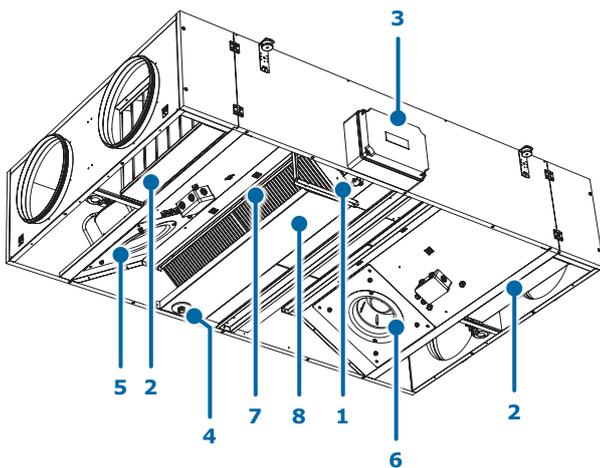
## LAYOUT OF THE UNIT

### SERVICE SIDE VIEW



Filter.  
(Filter change, see page 40).

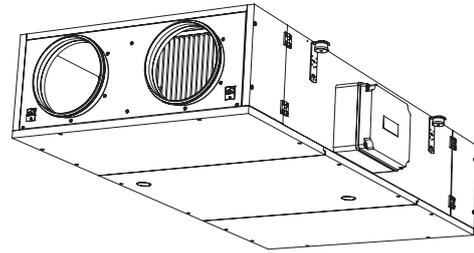
### MAINTENANCE SIDE VIEW



1. damper
2. Filters
3. Control board
4. Siphon connection
5. Air fan
6. Air fan
7. Heat recovery unit
8. Collection tray

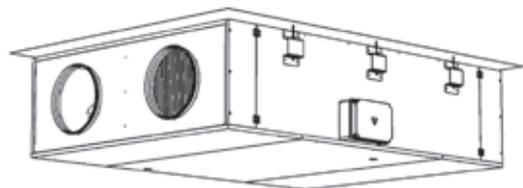
## CEILING INSTALLATION

### ENY-P1-S / ENY-P2-S / ENY-P3-S

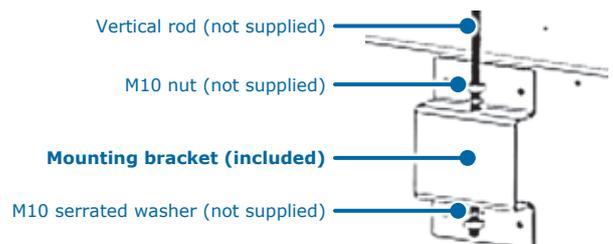


The **ENERGY PLUS** heat recovery unit comes with 4 mounting brackets which can be used together with vertical threaded rods or suspension chains to facilitate fixing to the ceiling and levelling. It is recommended to install and fix the unit in the correct position before making the connections to the ducted system or condensate discharge pipe (discharge side) and the electrical connections. The ducted system must be secured independently from the unit. Use the terminal block in the Control Panel of the unit to make the connections to the mains power supply.

### ENY-P4-S



It is not advisable to hang the **ENY P4** units from the ceiling. If strictly necessary, the unit must be supported from underneath with structural elements and vertical rods able to withstand its weight. When supporting the unit, make sure to leave sufficient clearance for maintenance and removal of the filters.



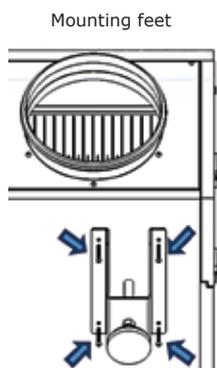
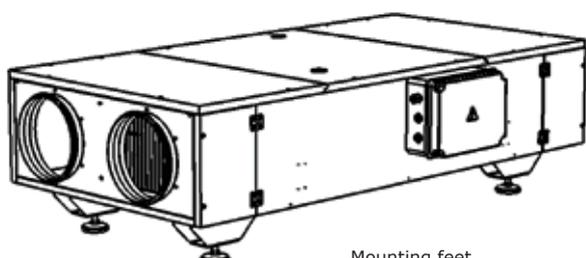
## FLOOR INSTALLATION

### INSTALLATION ON MOUNTING FEET

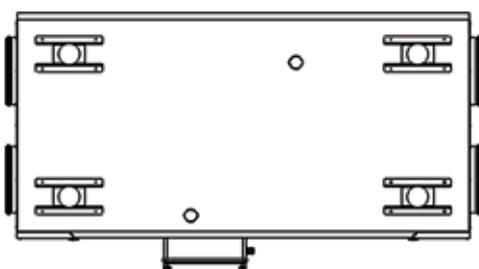
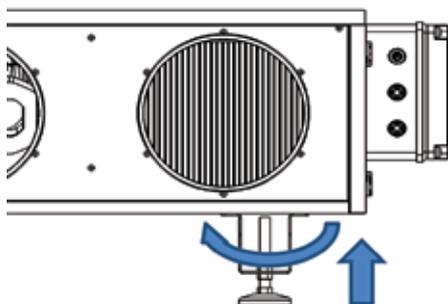
All the units are supplied with brackets on the base, which can be removed to install the unit in a suspended ceiling or in environments with height restrictions.

The mounting brackets can be removed by unscrewing the 4 M8 bolts in each corner of the bracket.

The unit can be levelled using the four mounting feet (six for sizes 4) attached to the brackets on the base.

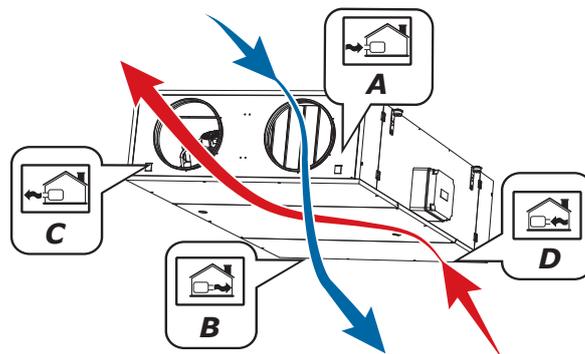


Turning the bolt in the mounting feet raises or lowers the corner of the unit. In this way, the unit can be adjusted to be made horizontal.

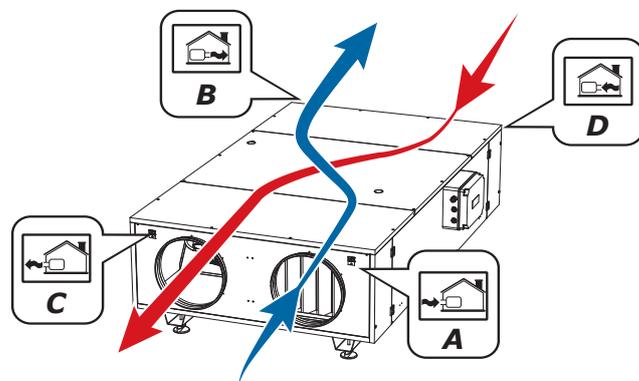


## AIR DUCT CONNECTIONS

### Typical Ceiling Installation



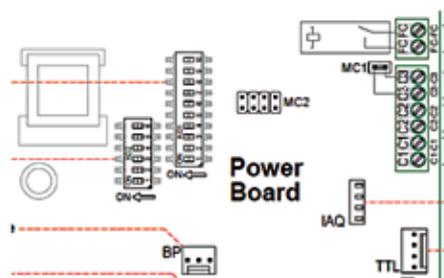
### Typical Floor Installation



- LEGENDA:**
- A** = Fresh air
  - B** = Supply air
  - C** = Exhausted air
  - D** = Extracted air

## INVERTING THE AIR FLOWS

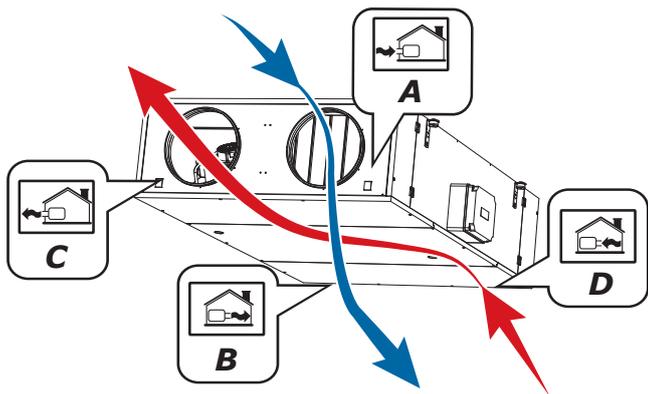
Where necessary, it is possible to invert the air flows in the pipeline at the configuration Dip switch 1 on the electronic power board. This causes the intake fan to act as a discharge fan and the board inverts the functions of the probes, so the air intake probe will be detected and considered as the ambient air extraction probe.



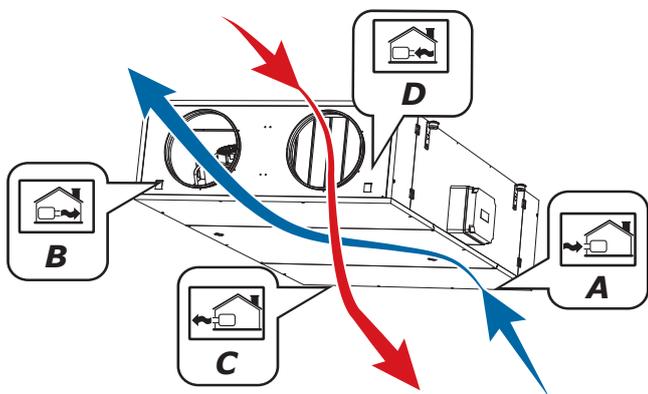
# INVERTING THE AIR FLOWS OF CEILING UNITS

In the case of ceiling units, the condensate tray needs to be moved in order to invert the flows.

*Typical Ceiling Installation*



*Inverted Air Flows of Ceiling Installation*

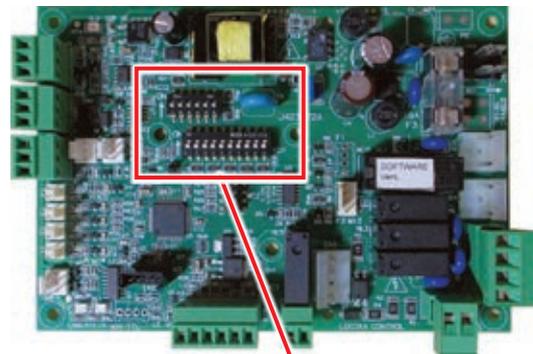


This operation is simple and involves the removal of the three lower panels and disassembly of the condensate tray for reassembly on the opposite side of the heat exchanger, turning it through 180°.

The central panel has a pre-punched hole which is to be opened for the condensate drain fitting. When not in use, the hole must be carefully sealed with closed-cell insulation.

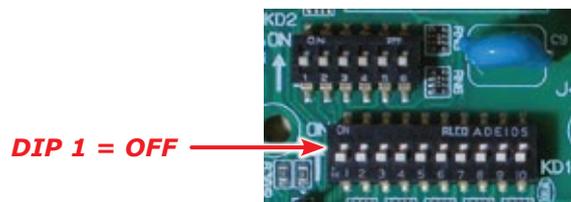
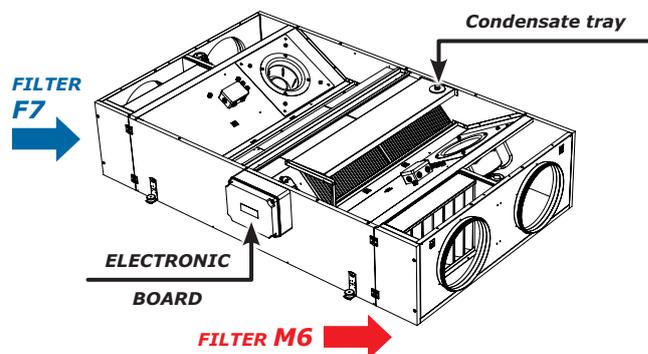
The location of the filters F7 and M6 must, therefore, be inverted (the views below show the machine overturned).

**FOR INVERTING THE FLOW:  
INVERT THE POSITION OF THE FILTERS F7-M6,  
THE LOCATION OF THE CONDENSATE TRAY  
AND THE POSITION OF DIP SWITCH 1  
ON THE ELECTRONIC POWER BOARD**



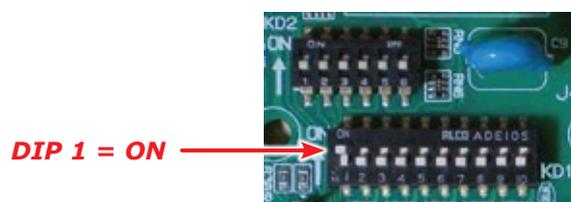
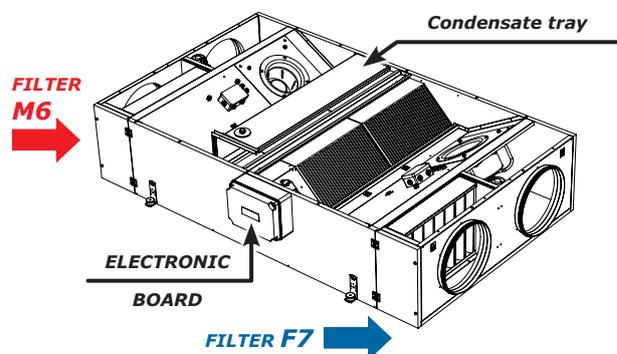
**DIP 1 position**

## TYPICAL OPERATION



**DIP 1 = OFF**

## INVERTING THE AIR FLOW OPERATION

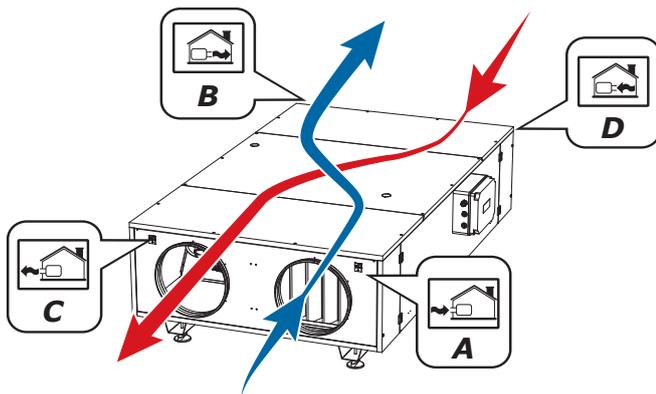


**DIP 1 = ON**

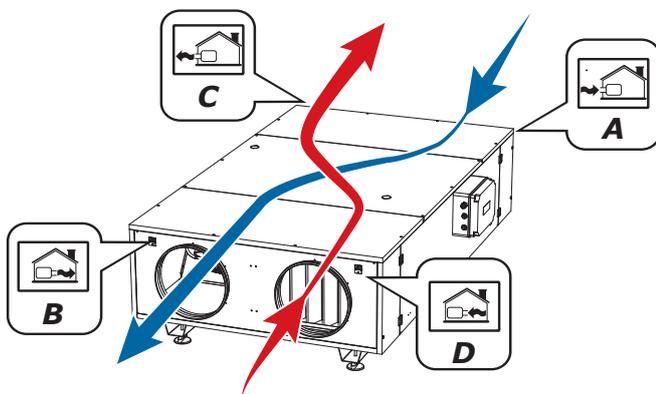
# INVERTING THE AIR FLOWS OF FLOOR UNITS

The floor units are equipped with two separate condensate trays for the option of inversion of the air flows.

**Typical Floor Installation**

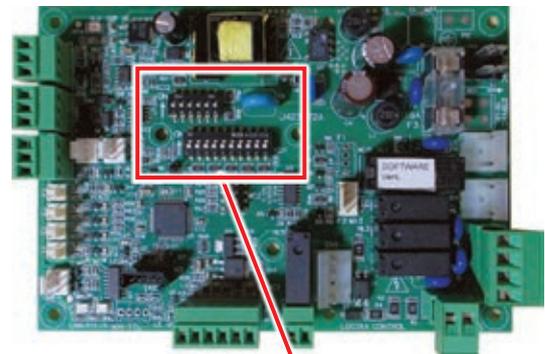


**Inverted Flows of Floor Installation**



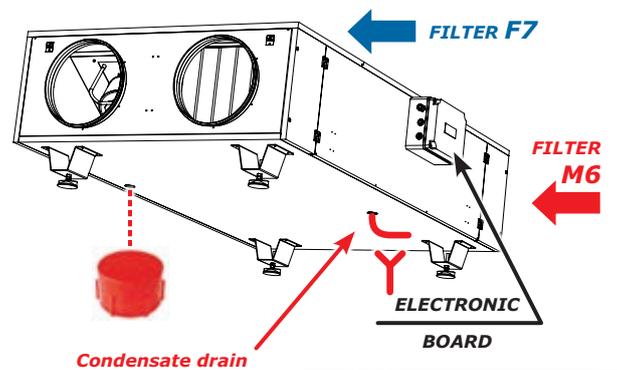
To invert the flows, therefore, set Dip 1 to ON, invert the position of the filters F7 and M6 and use the second condensate drain already set up by closing the one not in use

**FOR INVERTING THE FLOW:  
INVERT THE POSITION OF THE FILTERS F7-M6,  
THE THREADED CAPSULE  
AND THE POSITION OF DIP SWITCH 1  
ON THE ELECTRONIC POWER BOARD**

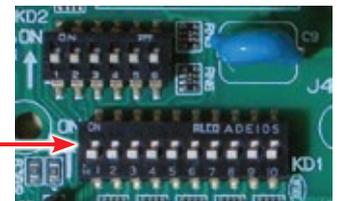


**DIP 1 position**

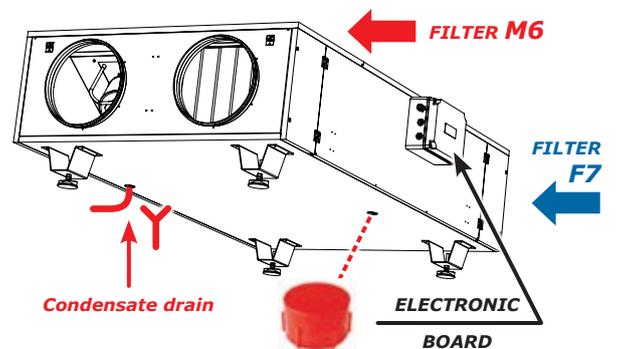
**TYPICAL OPERATION**



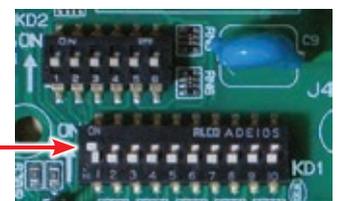
**DIP 1 = OFF**



**INVERTING THE AIR FLOW OPERATION**



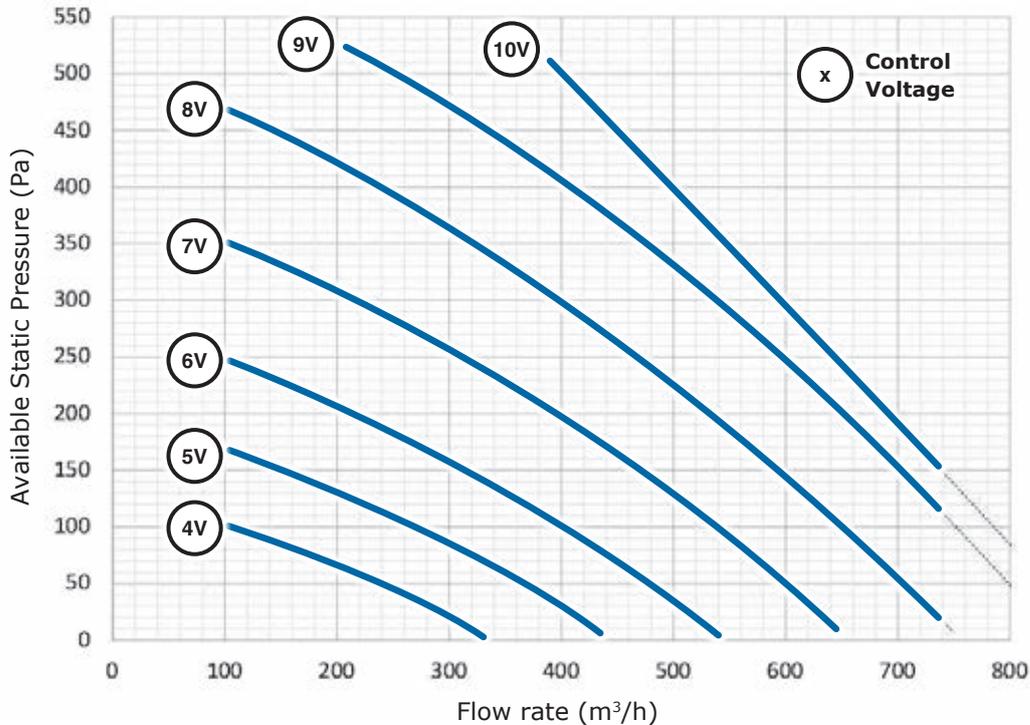
**DIP 1 = ON**



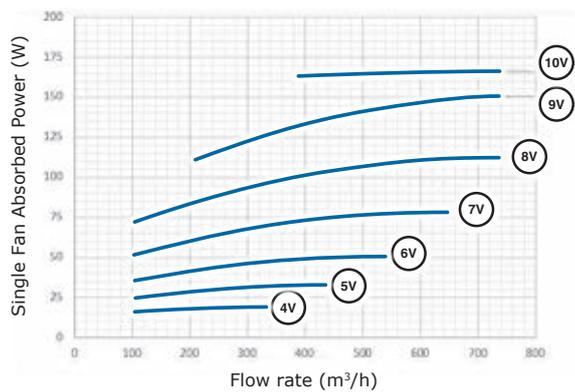
# ENY-P1 AIRFLOW PERFORMANCE

## SUPPLY AND RETURN VENTILATION CIRCUITS

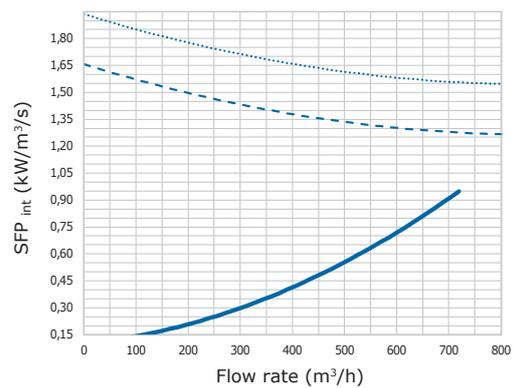
### Flow rate / Available static pressure



### ELECTRICAL POWER ABSORBED by the single circuit <sup>(1)</sup>



### SFP int <sup>(2)</sup> UE 1253/14



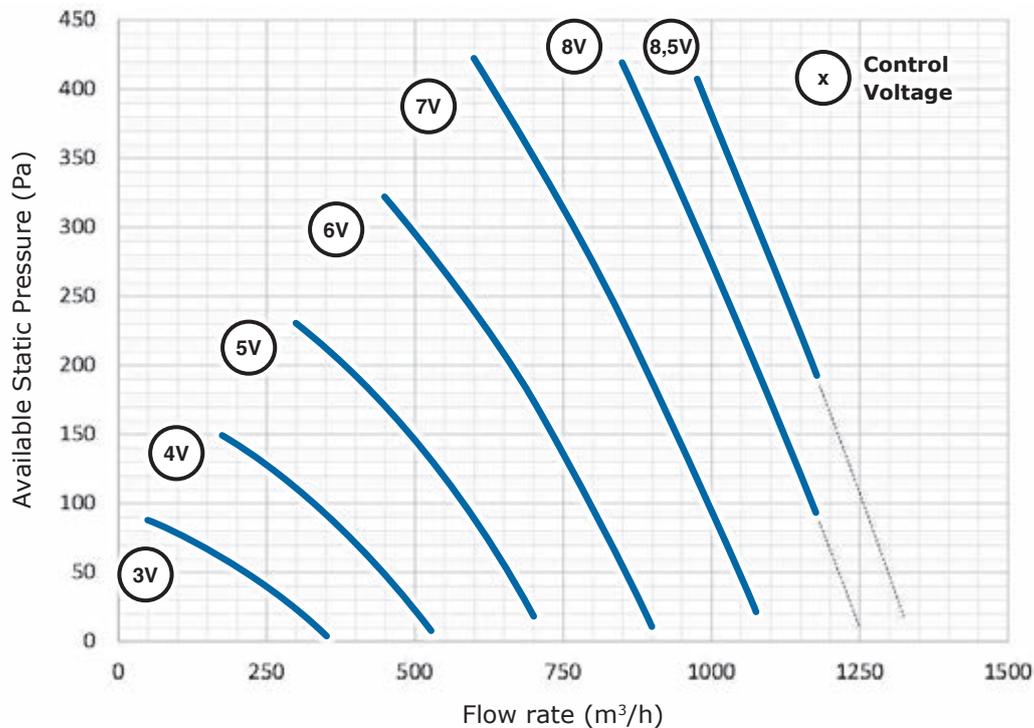
SFP int (kW/m³/s)  
 SFP int\_lim 2018 (kW/m³/s)  
 SFP int\_lim 2016 (kW/m³/s)

- 1) The indication of the power absorbed by the single fan is useful in the event that the two fans are calibrated at unbalanced flow rates and absorb different powers.
- 2) The charts provided in this catalogue to verify the SFPint apply in the event of flow rates balanced between supply and return.

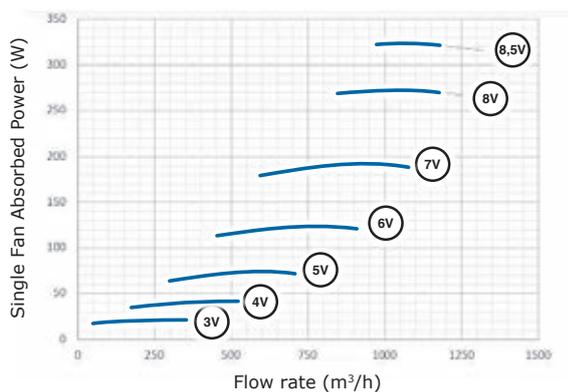
# ENY-P2 AIRFLOW PERFORMANCE

## SUPPLY AND RETURN VENTILATION CIRCUITS

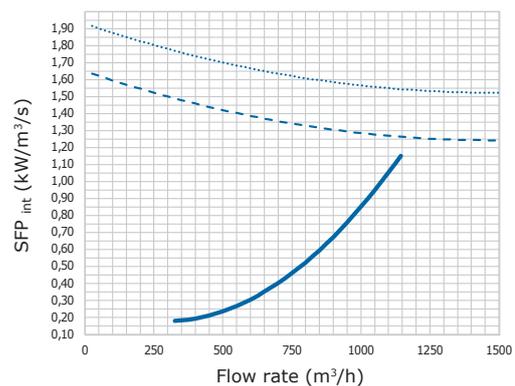
### Flow rate / Available static pressure



### ELECTRICAL POWER ABSORBED by the single circuit <sup>(1)</sup>



### SFP<sub>int</sub> <sup>(2)</sup> UE 1253/14



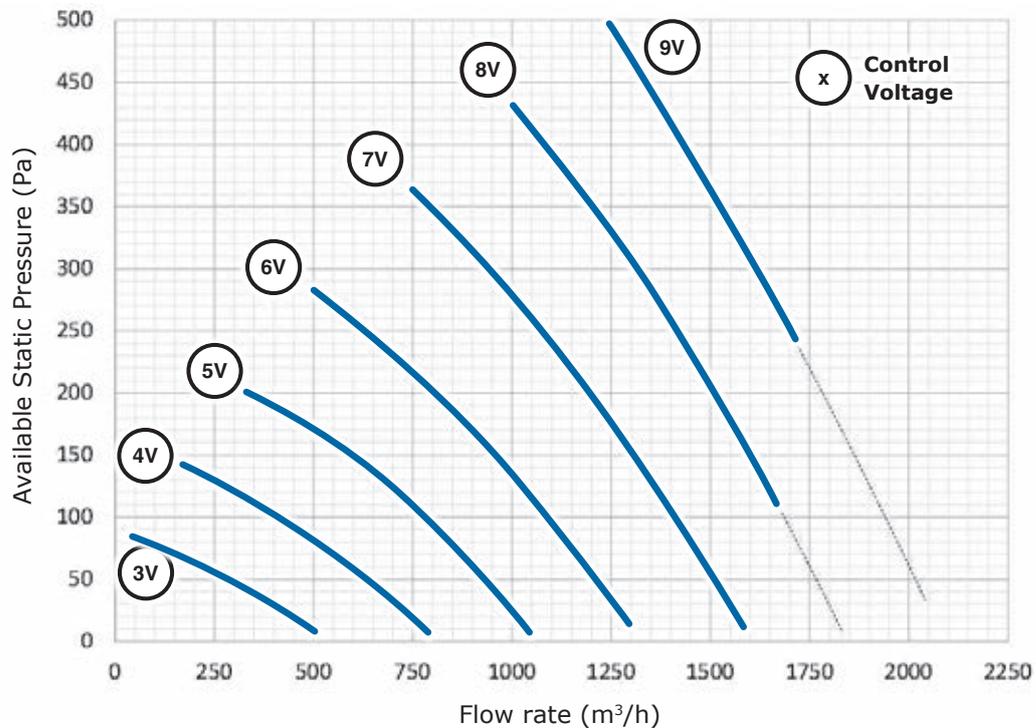
SFP<sub>int</sub> (W/m³/s)  
 SFP<sub>int\_lim</sub> 2018 (W/m³/s)  
 SFP<sub>int\_lim</sub> 2016 (W/m³/s)

- 1) The indication of the power absorbed by the single fan is useful in the event that the two fans are calibrated at unbalanced flow rates and absorb different powers.
- 2) The charts provided in this catalogue to verify the SFP<sub>int</sub> apply in the event of flow rates balanced between supply and return.

# ENY-P3 AIRFLOW PERFORMANCE

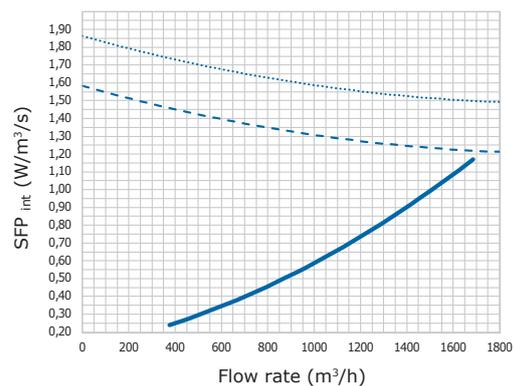
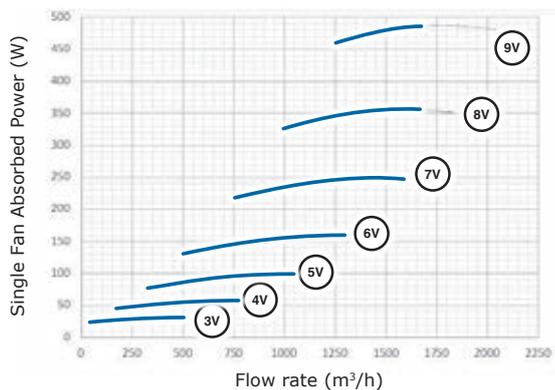
## SUPPLY AND RETURN VENTILATION CIRCUITS

### Flow rate / Available static pressure



### ELECTRICAL POWER ABSORBED by the single circuit <sup>(1)</sup>

### SFP<sub>int</sub> <sup>(2)</sup> UE 1253/14



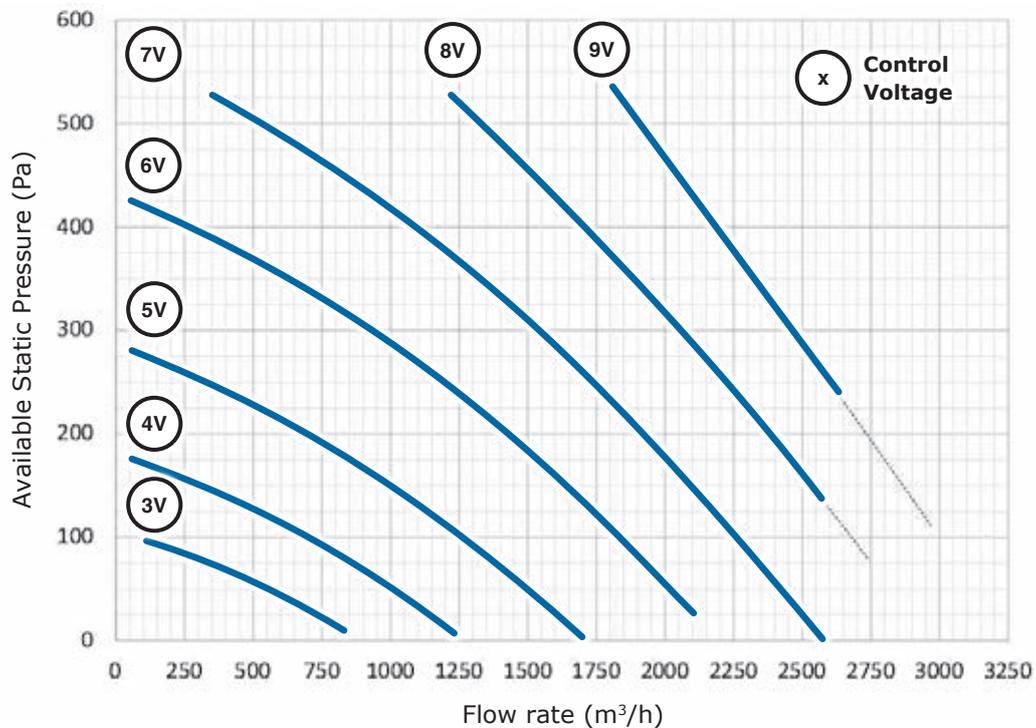
SFP<sub>int</sub> (kW/m³/s)  
 SFP<sub>int\_lim</sub> 2018 (kW/m³/s)  
 SFP<sub>int\_lim</sub> 2016 (kW/m³/s)

- 1) The indication of the power absorbed by the single fan is useful in the event that the two fans are calibrated at unbalanced flow rates and absorb different powers.
- 2) The charts provided in this catalogue to verify the SFP<sub>int</sub> apply in the event of flow rates balanced between supply and return.

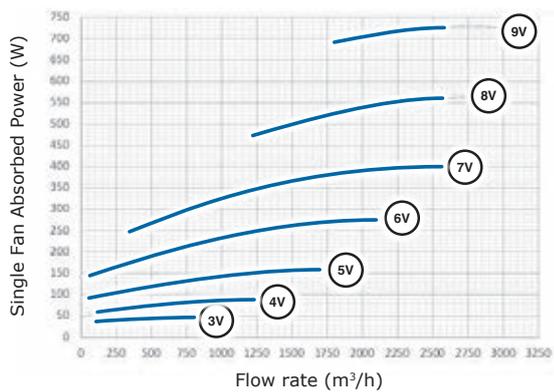
# ENY-P4 AIRFLOW PERFORMANCE

## SUPPLY AND RETURN VENTILATION CIRCUITS

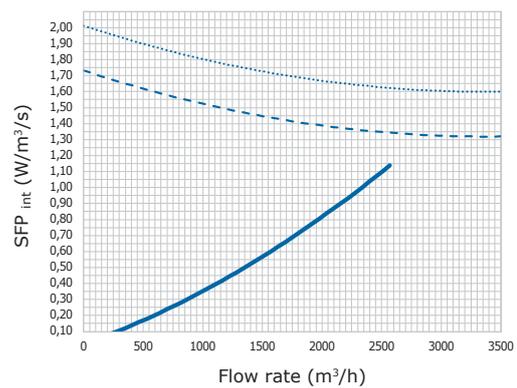
### Flow rate / Available static pressure



### ELECTRICAL POWER ABSORBED by the single circuit <sup>(1)</sup>



### SFP int <sup>(2)</sup> UE 1253/14



SFP<sub>int</sub> (W/m³/s)  
 SFP<sub>int\_lim 2018</sub> (W/m³/s)  
 SFP<sub>int\_lim 2016</sub> (W/m³/s)

- 1) The indication of the power absorbed by the single fan is useful in the event that the two fans are calibrated at unbalanced flow rates and absorb different powers.
- 2) The charts provided in this catalogue to verify the SFP<sub>int</sub> apply in the event of flow rates balanced between supply and return.

# THERMAL PERFORMANCE

Internal air conditions:  $t_i = 20^\circ\text{C}$  -  $UR_i = 50\%$

MODEL	TAE: 10°C				TAE: 5°C			TAE: 0°C			TAE: -5°C			TAE: -10°C		
	$Q_v$ m³/h	$P_h$ kW	$\epsilon_t$ %	$m_w$ kg/h												
ENY-P1	100	0,30	90,4	0,00	0,46	90,5	0,15	0,62	91,7	0,26	0,79	94,3	0,36	0,97	96,5	0,44
	150	0,44	88,2	0,00	0,67	88,3	0,21	0,90	89,8	0,38	1,17	92,7	0,53	1,44	95,4	0,65
	300	0,85	84,6	0,00	1,28	84,7	0,42	1,74	86,4	0,72	2,26	90,0	1,03	2,81	93,2	1,25
	450	1,25	82,6	0,00	1,87	82,7	0,62	2,55	84,5	1,09	3,34	88,4	1,52	4,16	91,9	1,85
	600	1,63	81,2	0,00	2,45	81,3	0,81	3,35	83,2	1,43	4,39	87,3	2,01	5,49	90,9	2,47
	750	2,01	80,1	0,00	3,03	80,2	0,96	4,13	82,2	1,71	5,43	86,4	2,43	6,80	90,1	3,01
ENY-P2	200	0,60	89,4	0,00	0,90	89,5	0,29	1,22	90,8	0,51	1,57	93,5	0,70	1,93	96,0	0,86
	250	0,74	88,2	0,00	1,11	88,3	0,36	1,50	89,7	0,63	1,94	92,7	0,88	2,40	95,3	1,08
	500	1,42	84,6	0,00	2,13	84,7	0,69	2,90	86,4	1,20	3,77	90,0	1,72	4,69	93,2	2,08
	750	2,08	82,5	0,00	3,12	82,6	1,04	4,25	84,5	1,81	5,56	88,4	2,52	6,93	91,8	3,09
	1000	2,72	81,1	0,00	4,08	81,2	1,35	5,57	83,1	2,38	7,31	87,2	3,35	9,14	90,8	4,12
	1250	3,35	80,0	0,00	5,04	80,1	1,68	6,88	82,1	2,85	9,04	86,3	4,05	11,32	90,0	5,00
ENY-P3	300	0,89	88,4	0,00	1,34	88,5	0,43	1,81	89,9	0,76	2,34	92,9	1,06	2,88	95,5	1,31
	400	1,17	86,9	0,00	1,75	87,0	0,56	2,38	88,5	1,00	3,08	91,8	1,37	3,81	94,6	1,69
	800	2,24	83,4	0,00	3,36	83,5	1,10	4,57	85,2	1,91	5,97	89,0	2,66	7,44	92,4	3,36
	1200	3,27	81,4	0,00	4,92	81,5	1,64	6,71	83,4	2,88	8,79	87,4	3,90	10,99	91,0	4,97
	1650	4,42	79,8	0,00	6,63	79,9	2,20	9,06	81,9	3,88	11,91	86,1	5,31	14,92	89,9	6,57
	2000	5,29	78,9	0,00	7,95	79,0	2,53	10,87	81,0	4,54	14,31	85,4	6,49	17,95	89,2	8,05
ENY-P4	400	1,28	95,3	0,00	1,92	95,4	0,63	2,58	96,1	1,10	3,27	97,5	1,50	3,97	98,7	1,75
	550	1,72	93,5	0,00	2,59	93,6	0,84	3,49	94,5	1,49	4,44	96,4	1,98	5,42	98,0	2,43
	1100	3,31	89,7	0,00	4,97	89,8	1,61	6,72	91,1	2,82	8,65	93,8	3,89	10,64	96,1	4,74
	1700	4,98	87,4	0,00	7,48	87,5	2,45	10,14	89,0	4,34	13,13	92,1	5,87	16,23	94,9	7,25
	2300	6,62	85,8	0,00	9,94	85,9	3,22	13,50	87,5	5,77	17,53	90,9	7,90	21,74	93,9	9,83
	2900	8,23	84,6	0,00	12,36	84,7	4,02	16,81	86,4	6,97	21,88	90,0	9,99	27,19	93,2	12,09

**KEY:**

- $t_i$  = Internal air temperature.
- $UR_i$  = Internal relative humidity.
- TAE = External air temperature.
- $Q_v$  = Intake air flow rate.
- $Q_r$  = Return air flow rate.
- $P_h$  = Thermal recovery on the intake flow.
- $\epsilon_t$  = Recovery efficiency with balanced flow rates.
- $m_w$  = Condensate production.
- $b$  = Unbalance percentage.
- $\epsilon_t^*$  = Recovery efficiency with unbalanced flow rates.
- $F_T$  = Correction coefficient according to EAT variation.
- $F_Q$  = Correction coefficient according to  $Q_v$  variation.

**FORMULAE:**

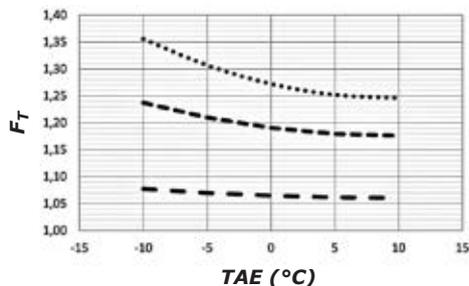
$$\epsilon_t = \frac{2980 P_h}{Q_v (t_i - TAE)}$$

$$b = Q_r / Q_v$$

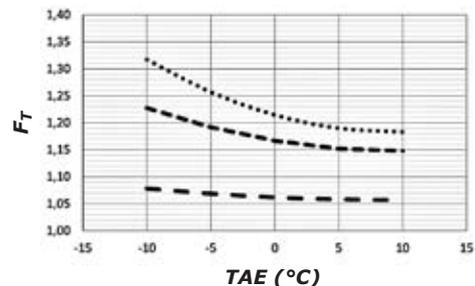
$$\epsilon_t^* = \epsilon_t \cdot b \cdot F_T \cdot F_Q$$

Correction coefficients of the recovery efficiency under unbalanced flow rate conditions

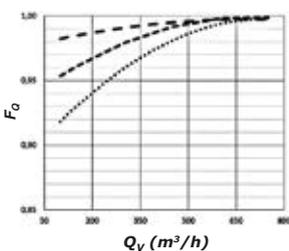
ENY-P1 / ENY-P2 / ENY-P3



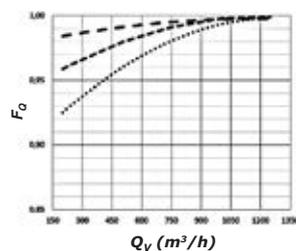
ENY-P4



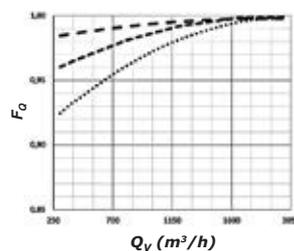
ENY-P1



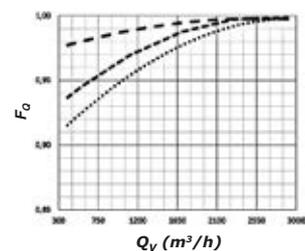
ENY-P2



ENY-P3



ENY-P4



## MAIN OPERATING LOGIC

### Antifreeze logic, electrical pre-heating resistance

In the event of installation in cold climates (indicatively with air temperatures below  $-5^{\circ}\text{C}$ ) to prevent the formation of ice inside the heat exchanger, you must install the electrical resistance accessory (BEP). This is managed automatically by the control board, mounted on the machine, by means of a PWM signal in order to optimise the electrical consumption according to the real needs.

The controller activates the resistance below a critical temperature of the external environment for the formation of ice in the heat exchanger and modulates the power of the resistance to maintain the exhaust air temperature above the freezing point.

### Free-cooling / free-heating management logic with by-pass gate

The following indoor air setpoint temperatures are defined:

$t_{\text{heating}}$ , normally  $20^{\circ}\text{C}$   
 $t_{\text{cooling}}$ , normally  $26^{\circ}\text{C}$

The following are also defined:

$t_i$  = internal air temperature  
 (return air)  
 EAT = External air temperature

#### FREE-COOLING CONDITION

$\text{EAT} > t_{\text{heating}}$  and simultaneously  $t_i > \text{EAT}$

Example:

In the summer, occasionally  
 $t_i = 25^{\circ}\text{C}$ , consistent  
 with operating setpoint  $t_{\text{cooling}} = 26^{\circ}\text{C} \pm 2^{\circ}\text{C}$ .  
 This condition may occur during an evening of  
 a very sunny day during which, however, the  
 outside air temperature is quite cool,  $\text{EAT} = 21^{\circ}\text{C}$ .  
 There is no need for heating,  
 because the winter setpoint is  $t_{\text{heating}} = 20^{\circ}\text{C}$ .

$\text{EAT} = 21^{\circ}\text{C} > 20^{\circ}\text{C}$  and  $t_i = 25^{\circ}\text{C} > \text{EAT}$ : the  
 external air can be used to cool the premises  
 for free.

#### FREE-HEATING CONDITION

$\text{EAT} < t_{\text{cooling}}$  and simultaneously  $t_i < \text{EAT}$

Example:

In a Mediterranean winter condition,  
 occasionally  $t_i = 21^{\circ}\text{C}$ , consistent  
 with operating setpoint  $t_{\text{heating}} = 20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ .  
 This condition may occur during the sunny  
 afternoon of a day characterised by a cold  
 morning. The outside air temperature heats up  
 and reaches the  $\text{EAT} = 23^{\circ}\text{C}$ .

There is no need to cool,  
 because the summer setpoint is  $t_{\text{cooling}} = 26^{\circ}\text{C}$ .

$\text{EAT} = 23^{\circ}\text{C} < 26^{\circ}\text{C}$  and  $t_i = 21^{\circ}\text{C} < \text{EAT}$ : the  
 external air can be used to heat the premises  
 for free.

In all the remaining conditions it is convenient  
 to maintain the heat recovery active to save on  
 heating in the winter and on air conditioning in  
 the summer.

### Operating logic with post-tre- atment elements

Downstream of the heat recovery unit, on the  
 ambient air intake duct, it is possible to install a  
 postheating resistance or a post-heating and/or  
 cooling coil.

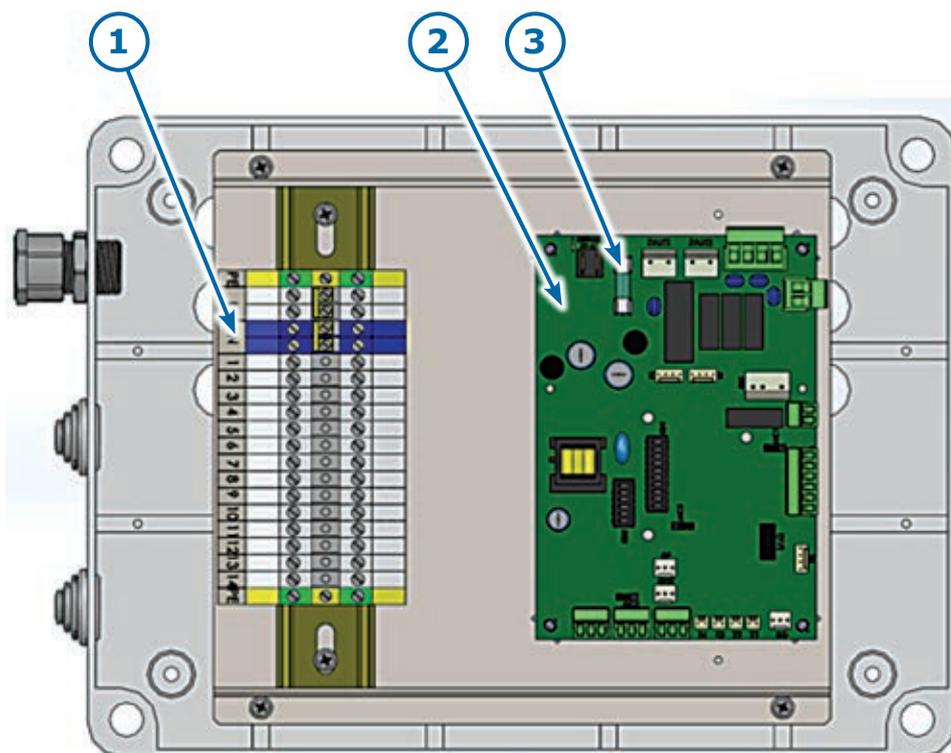
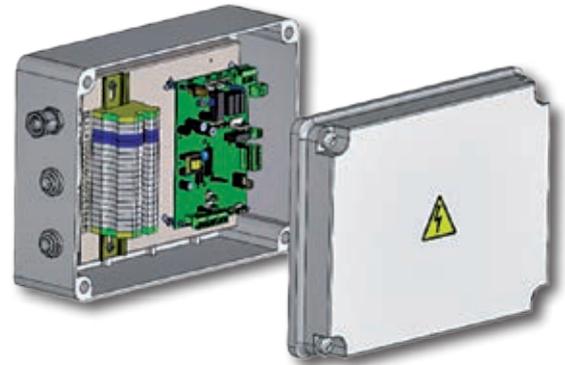
The machine controller can handle 230 volt  
 outputs for ON/OFF control of the resistance or  
 of the water shut-off valve feeding the post-  
 treatment coil. You can manage the post-heating  
 only or heating and/or cooling function both in  
 the 2 and 4 pipe configuration. The control of the  
 post-treatment elements is managed according  
 to the exhaust air temperature.

## ELECTRICAL PANEL

### *Electrical connections*

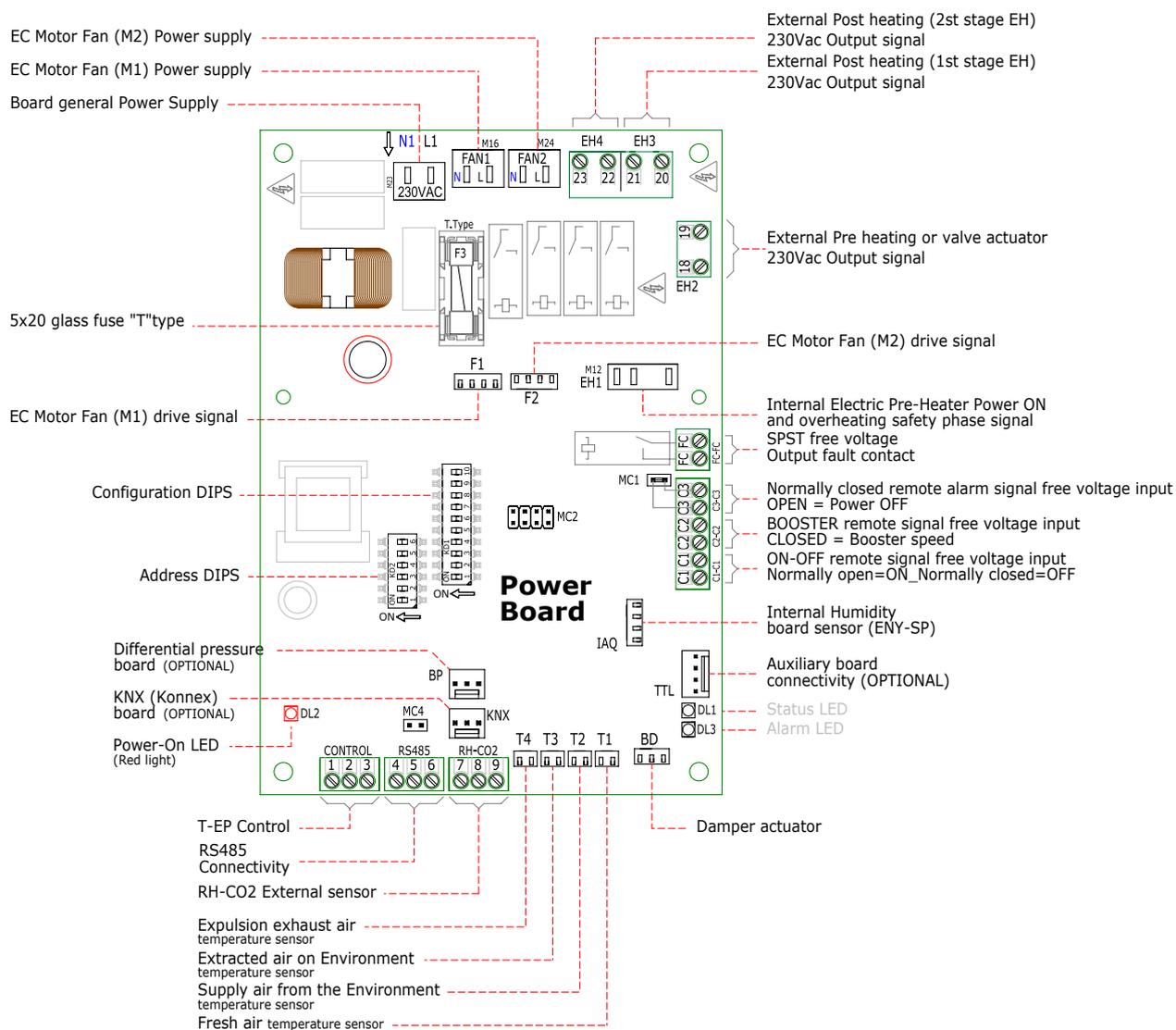
The terminals in the electrical panel are used to make the electrical connections. An omnipolar circuit breaker with a minimum contact opening gap of 3.5 mm.

- Fully disconnect the electrical power supply before carrying out any work on the unit.
- All electrical connections of the unit should be made by a qualified electrician.
- It is the customer's responsibility to set up the ground connection using the installation device of the building and a dedicated power supply isolated and equipped with thermal protection.
- Do not connect the unit to a power supply the voltage of which is not within the specifications.



- 1) Main terminal block for use by the installer
- 2) Electronic control board
- 3) Fuse of the electronic power board

## Electronic control board – Connections



### DEFAULT

### Configuration DIP switches



The electronic board is equipped with a set of 10 Dip switches for configuring the unit, i.e. the direction of use of the fans, and any accessories to be connected, such as pre- or post-air treatment coils.

DIP	OFF	ON
1	Installation of F1 intake to left	Installation of F2 intake to right
2	Without preheating	Preheating
3	PWM electric resistance	Valve actuator/E.R. ON/OFF
4	No post treatment	With post treatment
5	If 4 ON post heating only	If 4 ON post-heating/cooling
6	FC contact usable as remote general alarm status	FC contact to use as ON/OFF potential free contact for Crystall Filter
7	NA	—

**Legend of electrical panel**

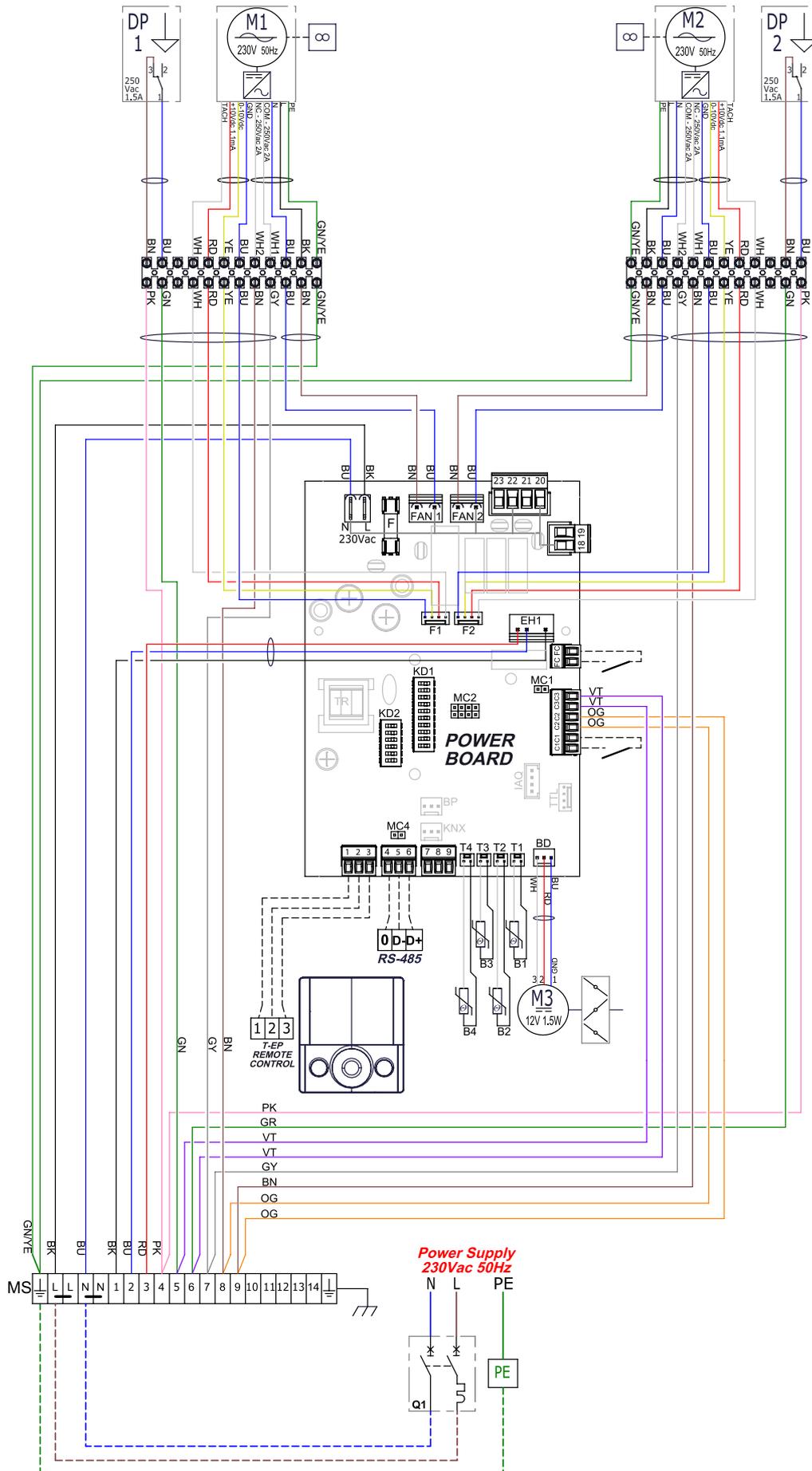
<b>Item</b>	<b>Description</b>	<b>Note</b>
<b>Q1</b>	<i>Automatic circuit breaker/isolator</i>	<i>At the customer's expense</i>
<b>M1-M1</b>	<i>Fan 1 and 2</i>	—
<b>DP1-DP2</b>	<i>Differential pressure switch 1 and 2</i>	—
<b>POWER BOARD</b>	<i>Electronic control board</i>	—
<b>F</b>	<i>Fuse of the electronic power board</i>	—
<b>18-19</b>	<i>Resistance preheating ON/OFF or hot valve actuator for preheating 230 Vac output</i>	—
<b>20-21</b>	<i>Post-heating 230 Vac output</i>	<i>For possible control of the electric coil section or valve actuator of the hot coil</i>
<b>22-23</b>	<i>Post-cooling 230 Vac output</i>	<i>For possible control of the valve actuator of the cold coil</i>
<b>FC-FC</b>	<i>NO potential free contact</i>	<i>Usable depending on the position of Dip 6</i>
<b>C1-C1</b>	<i>NO potential free contact for remote ON/OFF</i>	<i>If closed the machine stops</i>
<b>C2-C2</b>	<i>NC contact connected to the fan motor circuit breaker</i>	—
<b>C3-C3</b>	<i>NC contact connected to the filter differential pressure switches</i>	<i>Opens at the calibration value of the pressure switches</i>
<b>M3</b>	<i>Bypass damper actuator connection</i>	—
<b>B1/B2/B3/B4</b>	<i>PT1000 air probes</i>	—
<b>4-5-6</b>	<i>RS-485 connection</i>	—
<b>7-8-9</b>	<i>External sensors 0-10 V inputs</i>	<i>Optional connection of CO<sub>2</sub> sensor</i>

<b>MS</b>	<b>Terminal Block for Installer</b>
<b>1-2-3</b>	<i>Terminals for connection of ducted electric heater controlled by PWM signal</i>
<b>5-6</b>	<i>Terminals for connecting filter differential pressure switches</i>
<b>8-9</b>	<i>NC terminals for connecting the fan motor thermal protection</i>

<b>Fuses Table "F" form</b>	
<b>ENY-P1</b>	<i>5x20F 4 A 250V</i>
<b>ENY-P2</b>	<i>5x20F 6,3 A 250V</i>
<b>ENY-P3</b>	<i>5x20F 6,3 A 250V</i>
<b>ENY-P4</b>	<i>5x20F 8 A 250V</i>

<b>Code Table / CEI 16-6 colour</b>			
<b>BK</b>	<i>Black</i>	<b>GY</b>	<i>Grey</i>
<b>BN</b>	<i>Brown</i>	<b>WH</b>	<i>White</i>
<b>RD</b>	<i>Red</i>	<b>PK</b>	<i>Pink</i>
<b>OG</b>	<i>Orange</i>	<b>GD</b>	<i>Gold</i>
<b>YE</b>	<i>Yellow</i>	<b>TQ</b>	<i>Turquoise</i>
<b>GN</b>	<i>Green</i>	<b>SR</b>	<i>Silver</i>
<b>BU</b>	<i>Blue/light blue</i>	<b>GNYE</b>	<i>Green-yellow</i>
<b>VT</b>	<i>Purple</i>	—	—

Wiring diagram

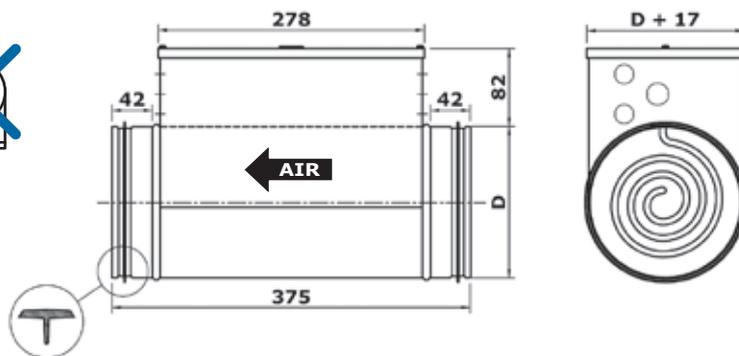
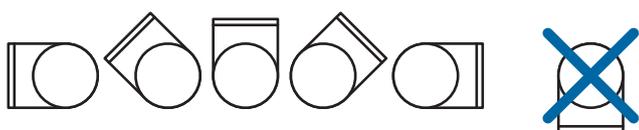
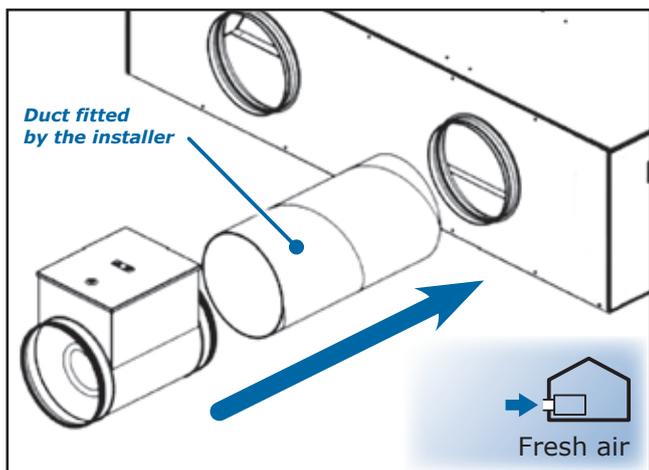
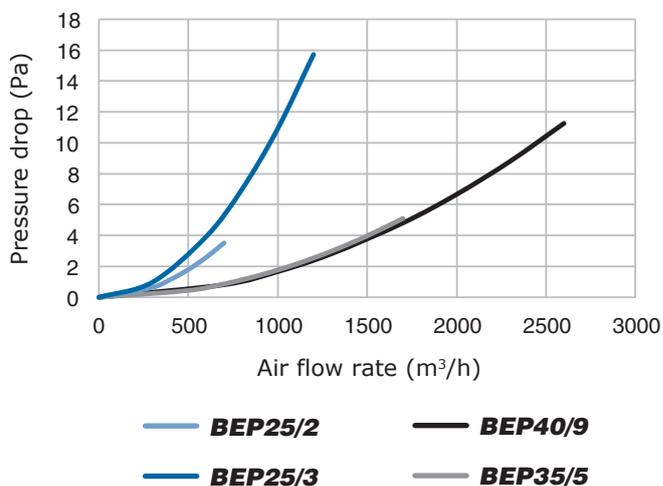


## ELECTRIC ANTIFREEZE COIL *BEP* (to be placed on the "External air" intake duct)

Electric heating coil consisting of armored elements inserted inside a galvanised sheet metal duct section with circular flanges and rubber gasket. The electric coil can be used in premises with air temperature between -20° C and +40° C and is equipped with double safety thermostat: one with automatic reset and one with manual reset. The purpose of the pre-heating resistance is to prevent the heat exchanger from freezing and is controlled from the control board with PWM modulating logic according to the external and exhaust air temperature. Protection class IP 43.



Pressure drop *BEP*

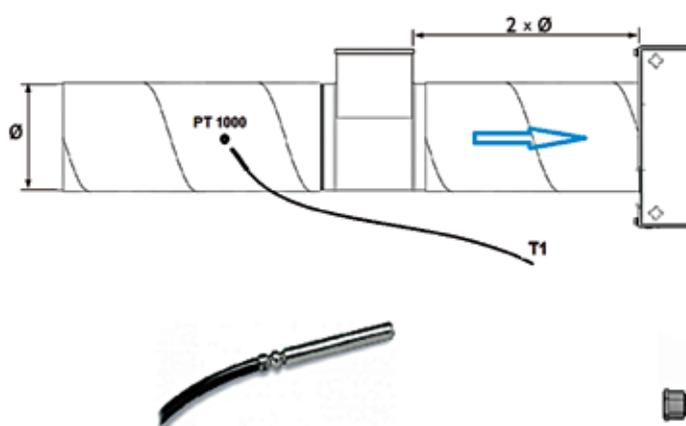


FOR HEAT RECOVERY UNIT		<i>ENY-P1</i>	<i>ENY-P2</i>	<i>ENY-P3</i>	<i>ENY-P4</i>
RESISTANCE IDENTIFICATION		<i>BEP 25/2/M</i>	<i>BEP 25/3/M</i>	<i>BEP 35/6/T</i>	<i>BEP 40/9/T</i>
CODE		<b>9022113</b>	<b>9022213</b>	<b>9022313</b>	<b>9022413</b>
Rated power	kW	2,1	3,0	6,0	9,0
Power supply voltage	V/Hz/Ph	230V 50Hz 1Ph + Pe		400V 50Hz 3Ph + Pe	
Amperes absorbed by the resistance	A	9,1	13,0	8,7	13,0
Circular Flange Diameter	<b>D</b> mm	250	250	355	400
Minimum air flow rate	m³/h	270	300	600	690

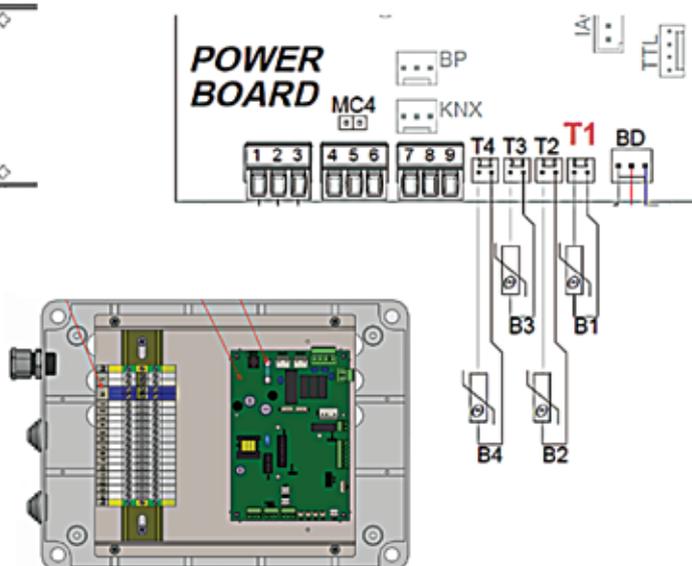
## Positioning probe T1 for antifreeze control

When using the electric coil, as with water for preheating, it is necessary to move the PT 1000 sensor on the fresh air intake to upstream of the preheating element.

The PT 1000 sensor is provided in the preheating accessory. You must drill a hole in the external air intake duct and then insert the sensitive element in the channel and then seal the hole.



The probe cable must then be taken to the electrical equipment and connected to Terminal T1 in the place of the standard probe mounted inside the unit. Then disconnect connector T1 of the internal probe and connect the connector T1 of the external probe.



## Notes on mounting the electric coil

The opening for access to the heater must be fitted with a fixed mesh or device that prevents touching the air intake of the element.

The distance between the heater and an elbow, a valve, a filter etc. in the duct must be at least twice the diameter of the duct, otherwise the flow of air through the heater might be irregular and cause activation of the thermal overheat protection.

The heater must be insulated as per the regulations relating to ventilation ducts. The insulation material must always be flame retardant. The cover of the heater must be free of insulation, so that the name tag can be clearly seen and the cover can be removed.

The installation area of the heater must remain accessible to permit replacement and servicing. The minimum distance between the metal casing of the heater and any wood or other combustible material must be 30 mm.

## MAINTENANCE

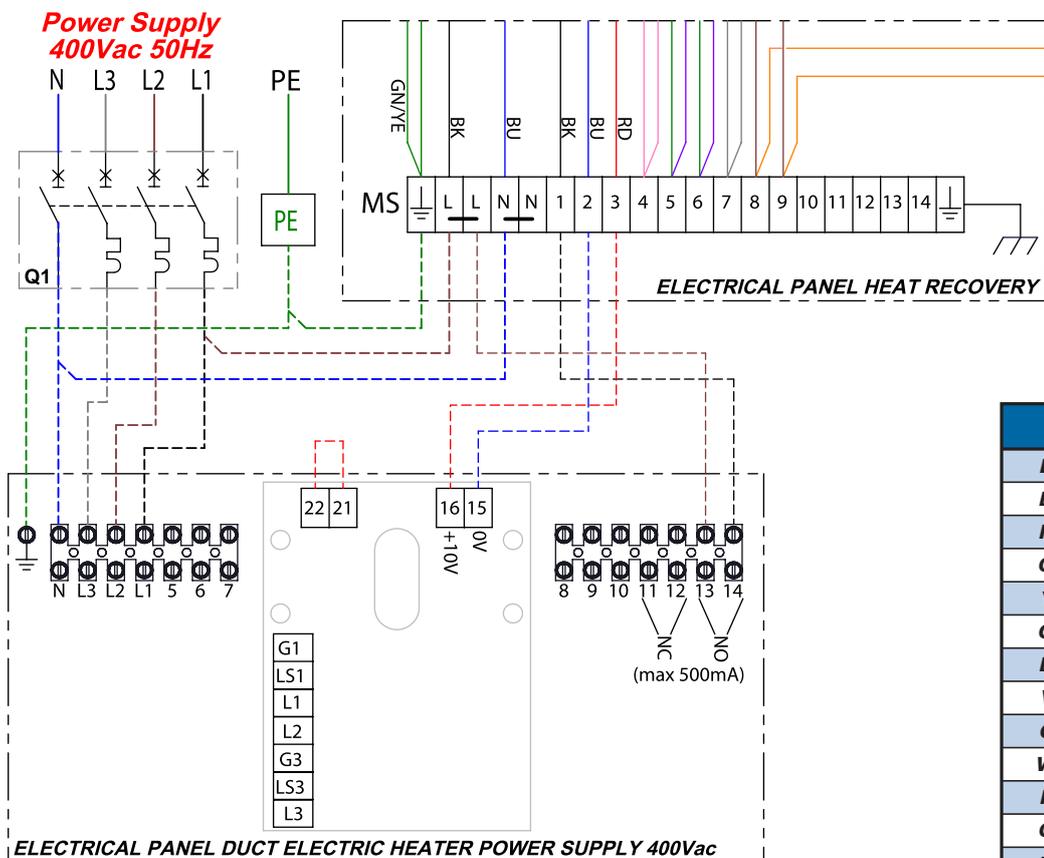
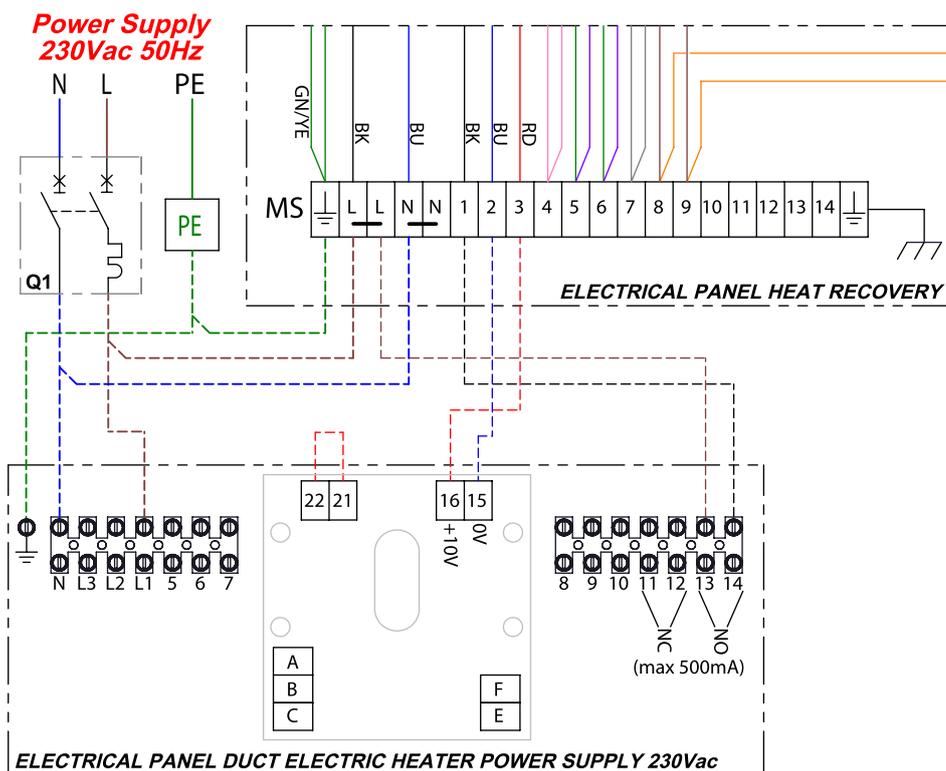
The unit is maintenance-free and requires only a periodic field test.

The electrical panel can be facing upwards or sideways, at an angle of 90° C max. The panel must **NOT** face downwards.

## OVERHEATING

When the thermal overheat protection with manual reset is activated, you must take the following measures: do not tamper with the heater in any way, e.g. do not remove the cover. Refer to an authorised electrician. Disconnect from the mains power supply and identify the cause for activation of the overload device. The overload device can be reset once the fault has been resolved.

**BEP resistance - Electrical connection**



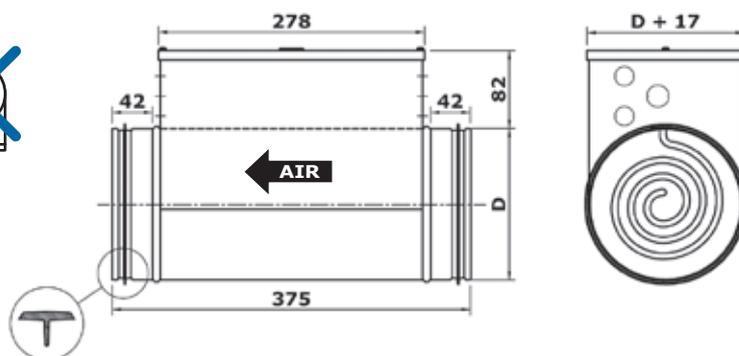
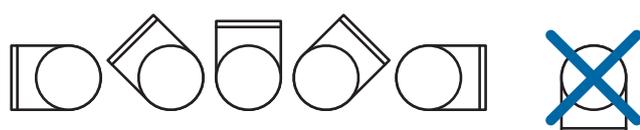
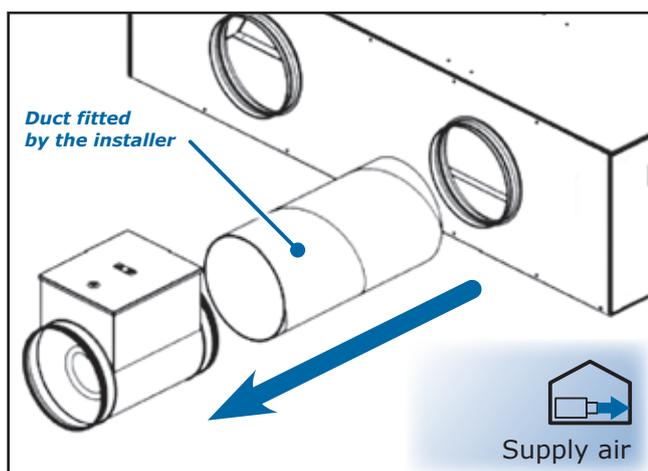
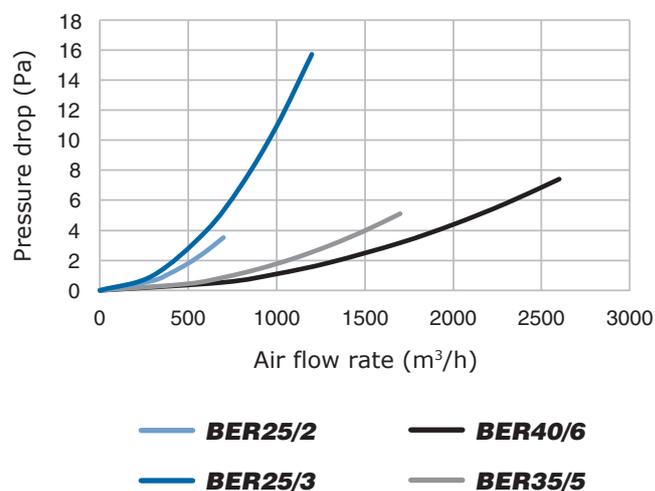
Legenda	
<b>BK</b>	Black
<b>BN</b>	Brown
<b>RD</b>	Red
<b>OG</b>	Orange
<b>YE</b>	Yellow
<b>GN</b>	Green
<b>BU</b>	Blue/light blue
<b>VT</b>	Purple
<b>GY</b>	Grey
<b>WH</b>	White
<b>PK</b>	Pink
<b>GD</b>	Gold
<b>TQ</b>	Turquoise
<b>SR</b>	Silver
<b>GNYE</b>	Green-yellow
—	Production wiring
- - - -	Connection responsibility of the installer

## ELECTRIC POST-HEATING COIL *BER* (to be placed on the "Intake air" duct)

Electric heating coil consisting of armored elements inserted inside a galvanised sheet metal duct section with circular flanges and rubber gasket. The electric coil can be used in premises with air temperature between -20° C and +40° C and is equipped with double safety thermostat: one with automatic reset and one with manual reset. Operation is controlled by the ON/OFF logic according to the ambient air temperature. The resistance supply circuit is fitted with an adjustable thermostat, which has a limiting function. Protection class IP 43.



Pressure drop *BER*



FOR HEAT RECOVERY UNIT		<i>ENY-P1</i>	<i>ENY-P2</i>	<i>ENY-P3</i>	<i>ENY-P4</i>
RESISTANCE IDENTIFICATION		<i>BER 25/2/M</i>	<i>BER 25/3/M</i>	<i>BER 35/5/T</i>	<i>BER 40/6/T</i>
CODE		<b>9022114</b>	<b>9022214</b>	<b>9022314</b>	<b>9022414</b>
Rated power	kW	2,1	3,0	4,5	6,0
Power supply voltage	V/Hz/Ph	230V 50Hz 1Ph + Pe		400V 50Hz 3Ph + Pe	
Amperes absorbed by the resistance	A	9,1	13,0	7,2	8,7
Circular Flange Diameter <b>D</b>	mm	250	250	355	400
Minimum air flow rate	m³/h	270	300	600	690

The post-heating electric coil prevents the temperature of the intake air from being too low and ensures environmental comfort.

Operation of the resistance is controlled according to the temperature of the intake air. The intake air temperature can then be adjusted at the thermostat located above the same resistance.

### **FASTENING**

The resistance is connected to the system on the air supply channel. The air that passes through the heater must flow in the direction indicated by the arrow on the side of the heater, near the terminal block. The heater can be installed in a vertical or horizontal duct, and must be made of fire retardant material resistant to both heat and cold.

The distance between the heater and an elbow, a valve, a filter etc. in the duct must be at least twice the diameter of the duct, otherwise the flow of air through the heater might be irregular and cause activation of the thermal overheat protection.

The heater must be insulated as per the regulations relating to ventilation ducts. The insulation material must always be flame retardant. The cover of the heater must be free of insulation, so that the name tag can be clearly seen and the cover can be removed.

The installation area of the heater must remain accessible to permit replacement and servicing. The minimum distance between the metal casing of the heater and any wood or other combustible material must be 30 mm.

### **MAINTENANCE**

The unit is maintenance-free and requires only a periodic field test.

The electrical panel can be facing upwards or sideways, at an angle of 90° C max. The panel must **NOT** face downwards.

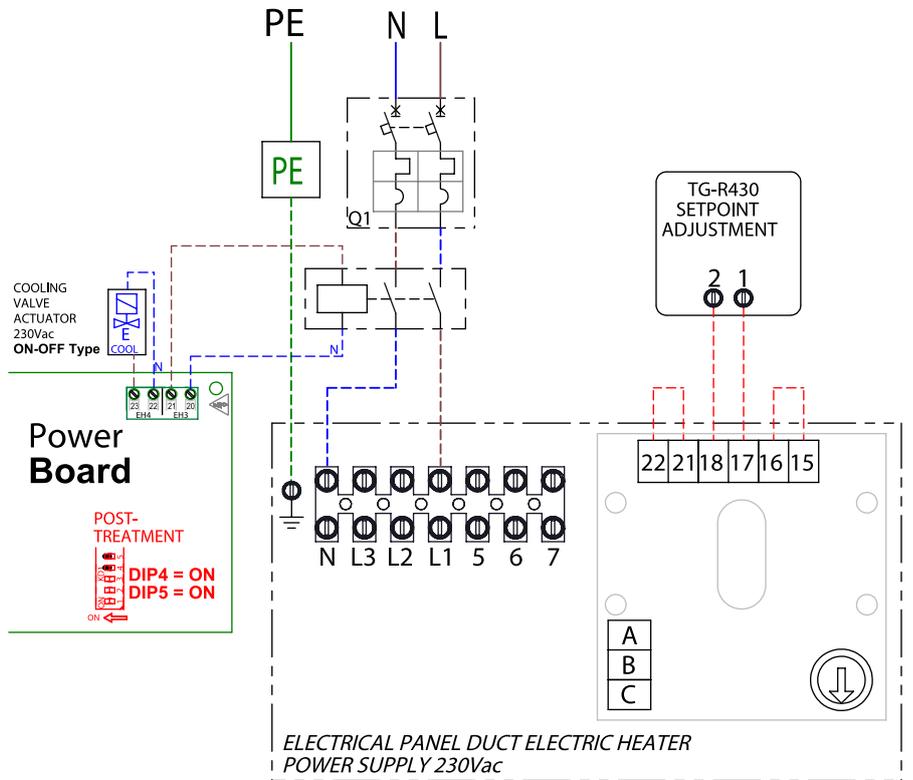
### **OVERHEATING**

When the thermal overheat protection with manual reset is activated, you must take the following measures: do not tamper with the heater in any way, e.g. do not remove the cover. Refer to an authorised electrician. Disconnect from the main power supply and identify the cause for activation of the overload device. The overload device can be reset once the fault has been resolved.

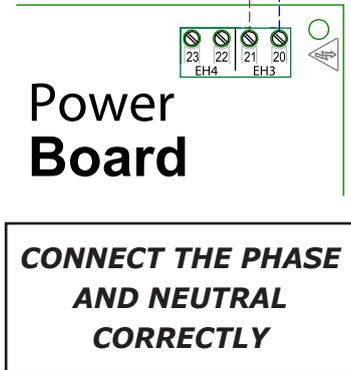


**BER resistance - Electrical connection**

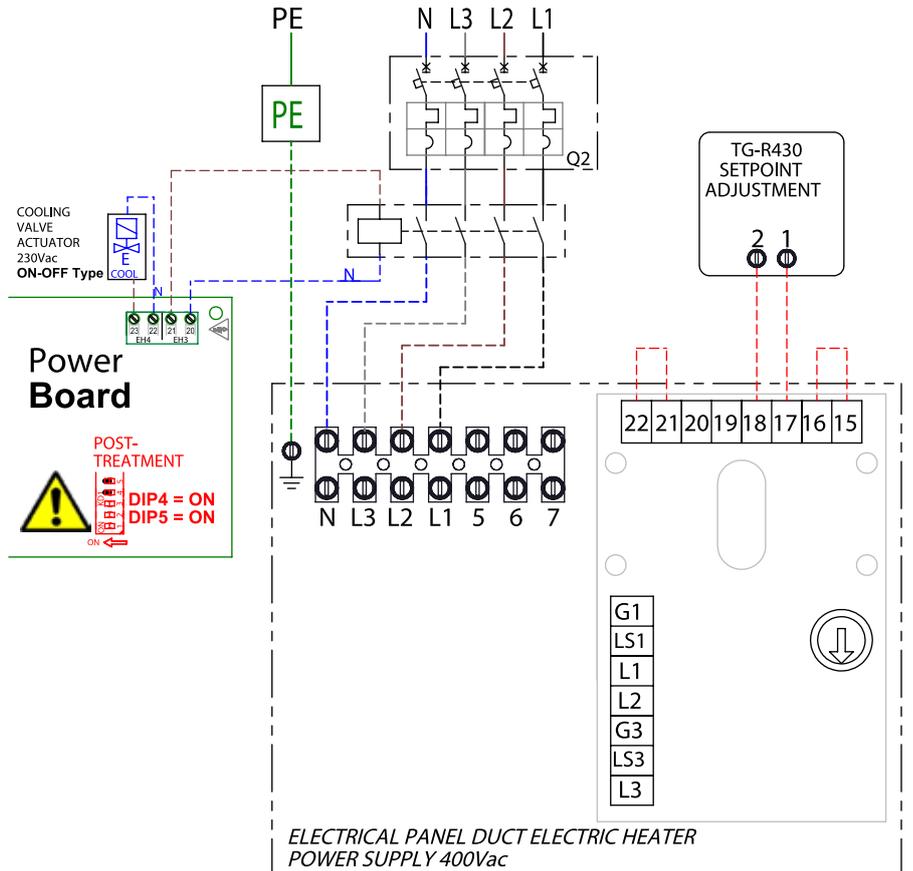
**Power Supply  
230Vac 50Hz**



**L N**

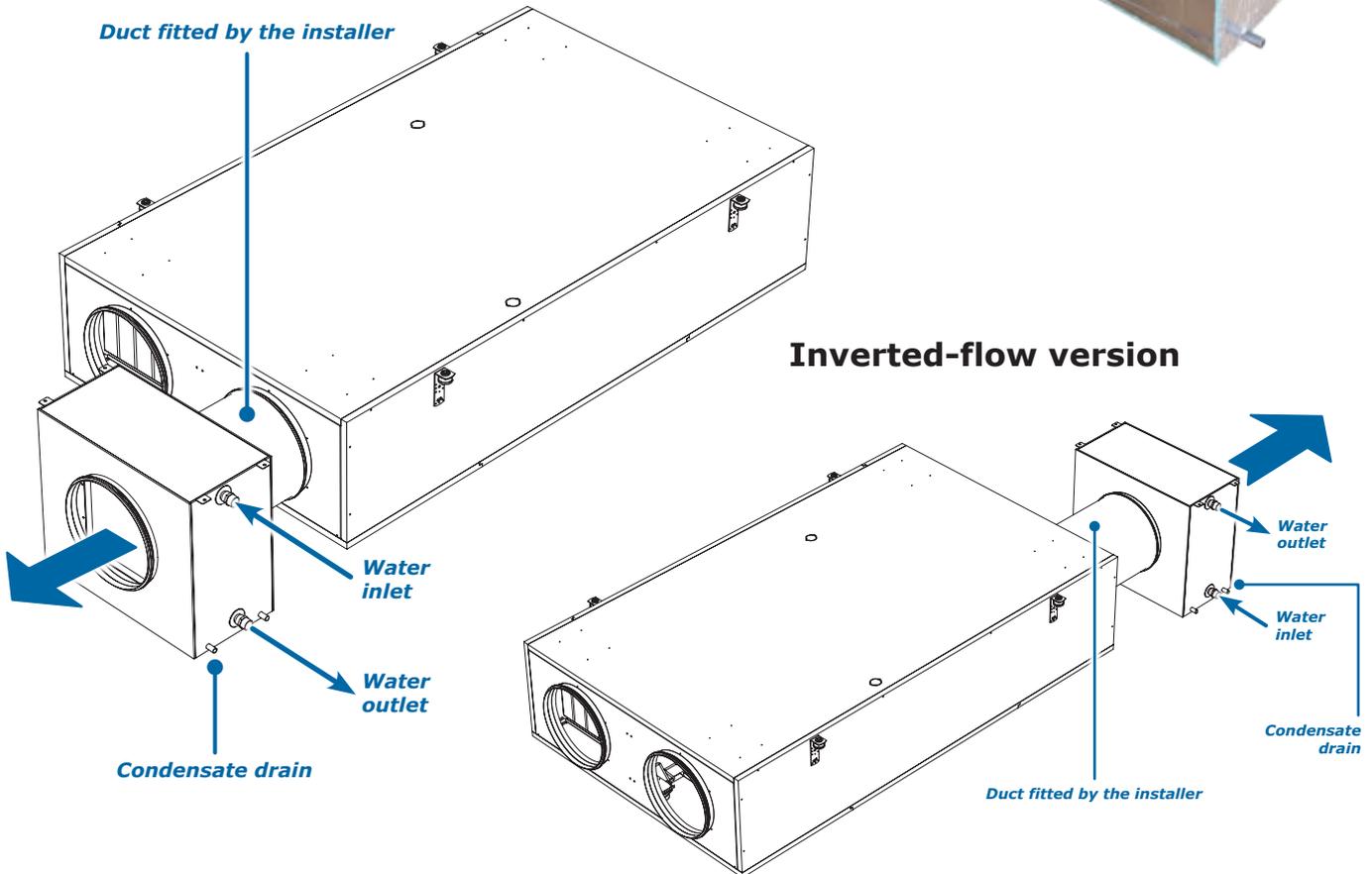
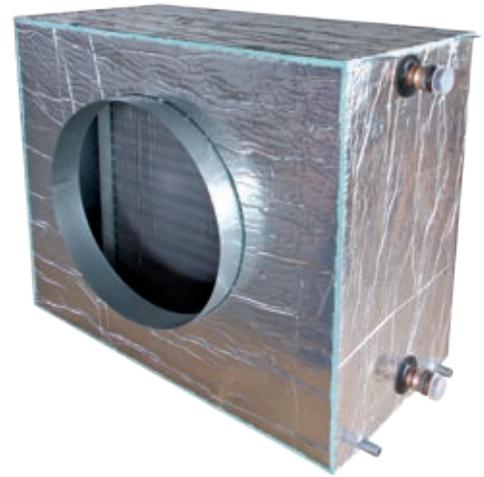


**Power Supply  
400Vac 50 Hz**



## WATER COIL

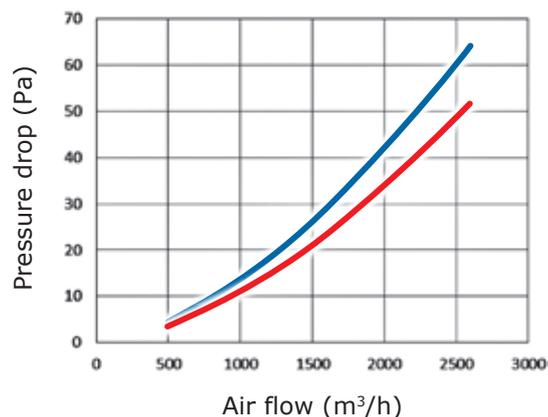
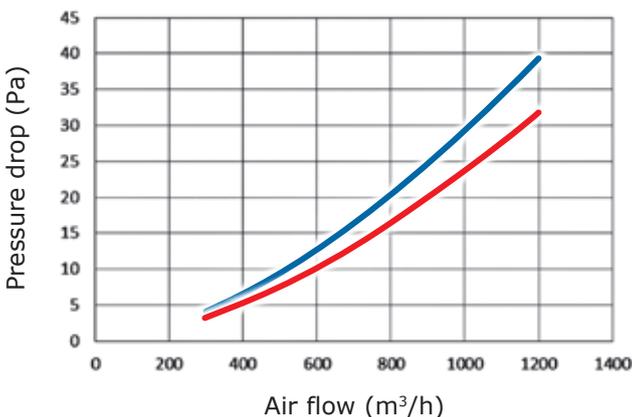
It consists of a galvanised steel structure insulated externally complete with circular flanges which facilitate its connection to the heat recovery unit or application to the circular duct. The interior of the section is fitted with a finned coil mounted on a special supporting frame made of galvanised sheet metal, expanded 3/8" copper tubes, aluminium fins pitch 2.5 mm, brass manifolds protruding at the sides. The interior of the section contains the condensate collection tray with 16 mm drain fitting. The treatment section is suitable both for post-heating and for cooling the intake air.



### Air side pressure drop

**ENY-P1 / ENY-P2**

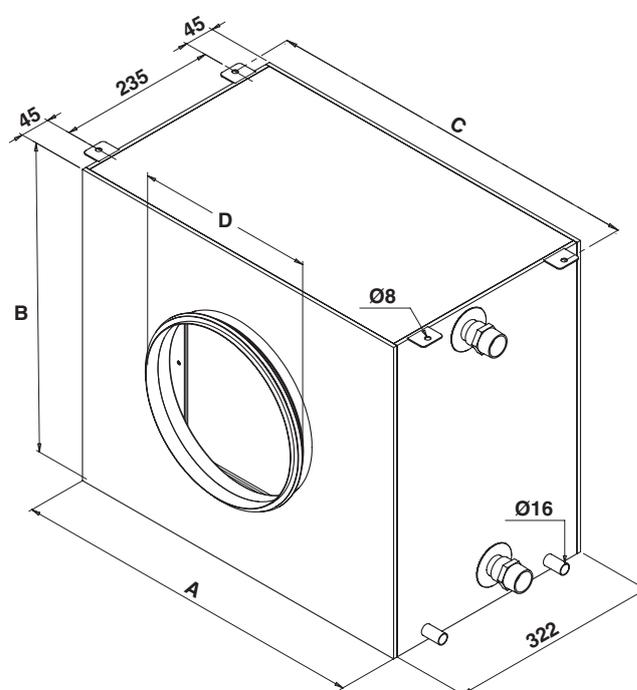
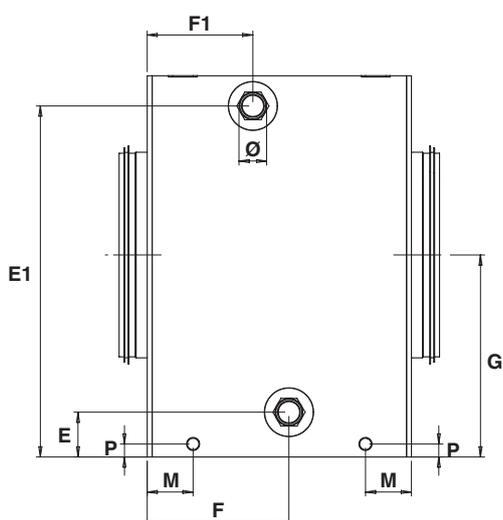
**ENY-P3 / ENY-P4**



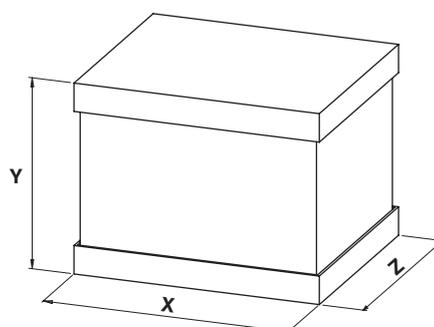
COLD

HOT

<i>FOR HEAT RECOVERY UNIT</i>		<b>ENY-P1</b>	<b>ENY-P2</b>	<b>ENY-P3</b>	<b>ENY-P4</b>	
<i>COIL IDENTIFICATION</i>		<b>BAE 1-2</b>	<b>BAE 1-2</b>	<b>BAE 3</b>	<b>BAE 4</b>	
<i>CODE</i>		<b>9022012</b>	<b>9022012</b>	<b>9022013</b>	<b>9022014</b>	
Dimensions	<b>A</b>	mm	536	536	645	645
	<b>B</b>	mm	468	468	568	568
	<b>C</b>	mm	567	567	676	676
	<b>D</b>	mm	250	250	355	400
	<b>E</b>	mm	55	55	55	55
	<b>F</b>	mm	180	180	180	180
	<b>E1</b>	mm	431	431	531	531
	<b>F1</b>	mm	133	133	133	133
	<b>G</b>	mm	250	250	300	300
Diameter	$\emptyset$		1"	1"	1"	1"
Condensate drain	<b>M</b>		56	56	56	56
	<b>P</b>		16	16	16	16



**Packaging dimensions**



<i>MODEL</i>		<b>ENY-P1 / P2</b>	<b>ENY-P3</b>	<b>ENY-P4</b>	
Dimensions	<b>X</b>	mm	690	800	800
	<b>Y</b>	mm	540	540	540
	<b>Z</b>	mm	590	700	700

## AUXILIARY SECTIONS

The Energy heat recovery units can be matched with the Ocean SB4 + BCR sections (condensate collection tray) or with the Ocean SFE sections;

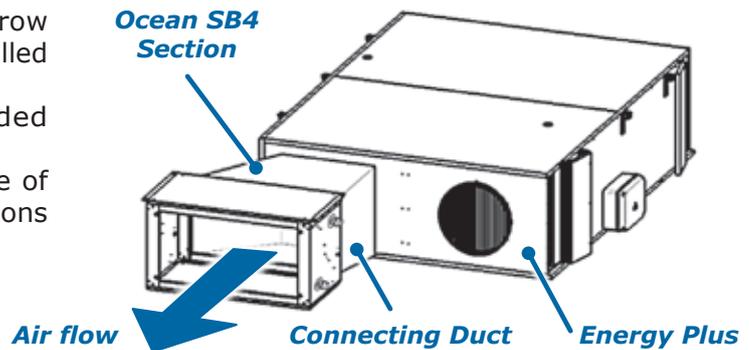
this is achieved by using the special Connecting Duct.

### ***Ocean air handling section with 4 row coil – Ocean SB4***

The SB4 sections are equipped with a 4-row heat exchange coil suitable to be fed with chilled water.

The table below shows the recommended combinations.

When ordering indicate the connections side of the coil section; in the picture the connections side is on the left.



FOR HEAT RECOVERY UNIT	CONNECTING DUCT		OCEAN AIR HANDLING SECTION WITH 4 ROW COIL		OCEAN CONDENSATE COLLECTION TRAY	
	IDENTIFICATION CODE		IDENTIFICATION CODE		IDENTIFICATION CODE	
<b>ENY-P1</b>	<b>ENP 1-2</b>	<b>9022116 +</b>	<b>SB4 1-2</b>	<b>0035004 +</b>	<b>BRC 1-2</b>	<b>9035020</b>
<b>ENY-P2</b>	<b>ENP 1-2</b>	<b>9022116 +</b>	<b>SB4 1-2</b>	<b>0035004 +</b>	<b>BRC 1-2</b>	<b>9035020</b>
<b>ENY-P3</b>	<b>ENP 3</b>	<b>9022316 +</b>	<b>SB4 3</b>	<b>0035019 +</b>	<b>BRC 3</b>	<b>9035021</b>
<b>ENY-P4</b>	<b>ENP 4</b>	<b>9022416 +</b>	<b>SB4 4</b>	<b>0035034 +</b>	<b>BRC 4</b>	<b>9035022</b>

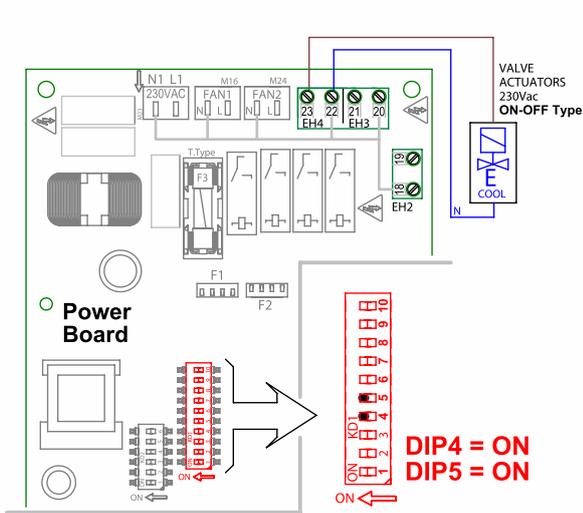
### ***Connecting the valve actuator of the post-treatment coil***

The coil section can be used to cool the air before release into the room, using a 2-pipe system for cooling only, or to cool/heat, using a reversible 2-pipe system.

It is equally possible to connect a dual coil, in the case of a 4-pipe system, or a cooling coil in combination with a post-heating electric coil.

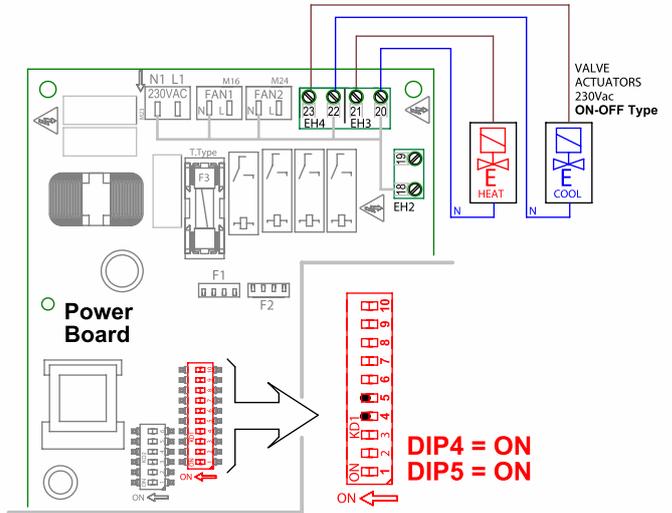
### POST-TREATMENT COOLING MODE

- COOLING MODE WITH EXTERNAL ON-OFF 230Vac VALVE ACTUATOR



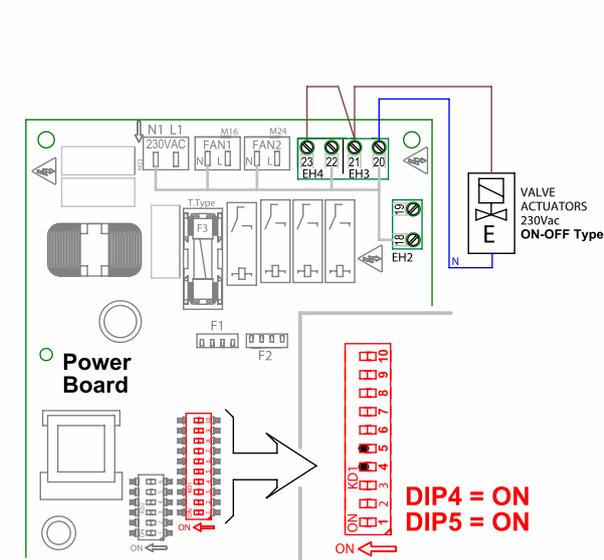
### POST-TREATMENT 4 PIPES MODE

- COOLING MODE WITH EXTERNAL ON-OFF 230Vac VALVE ACTUATOR
- HEATING MODE WITH EXTERNAL ON-OFF 230Vac VALVE ACTUATOR



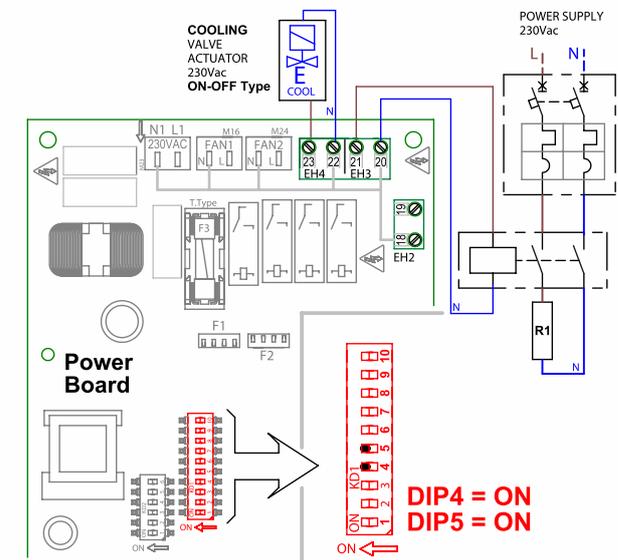
### POST-TREATMENT 2 PIPES MODE

- TREATING MODE WITH EXTERNAL ON-OFF 230Vac VALVE ACTUATOR



### POST-TREATMENT 4 PIPES MODE (Heating mode with electric heater)

- COOLING MODE WITH EXTERNAL ON-OFF 230Vac VALVE ACTUATOR
- HEATING MODE WITH EXTERNAL ON-OFF SINGLE PHASE 230Vac ELECTRIC HEATER (POWER ON 230Vac SIGNAL)



## MAINTENANCE OF THE WATER COIL

### HYDRAULIC CONNECTIONS FOR WATER COIL

The connections for the pipes of the heater should not be forced to bear the entire weight of the outer pipes. The pipes should not be subject to forces due to the thermal expansion of the outer pipes. The connections must be protected against shock, external loads and mechanical stresses. Mechanical loads and shocks may damage the manifold.

### ANTIFREEZE PROTECTION

In case of freezing risk and consequent damage to the pipes, one of the two following measures must be taken:

- Top up the coil with a suitable anti-freeze. The coil capacity is stated on the rating plate affixed to the side of the coil connections.
- Drain all the water from the pipes and coil. Do not mount the plugs on the coil before topping the system up again with water. Blow compressed air in the coil to make sure it is completely free of water.

### HIGH TEMPERATURES

During installation and maintenance of a coil that uses water as a medium and in which the temperature of the water can exceed 100°C, use extreme caution when opening the vent valves and shut-off valves of the system. The escape of hot water or steam can cause serious personal injury. SABIANA accepts no responsibility for the connection of the heater to the heating system or for any damage due to the design, installation or incorrect maintenance of this system. Pipes, valves etc. must be appropriately sized taking account of the pressure drop and operation, and not the size of the coil connections.

### FILLING, VENTING AND DRAINAGE

The connecting pipes of the water coil are not equipped with a vent valve and a drain valve. The vent and drain valves should be fitted during installation of the system, positioning them appropriately at the highest and lowest points of the system. The air must be vented completely from the system to ensure proper operation. To check that the heater is vented completely, blow compressed air in the pipes.

### CONDENSATE DRAIN

In the case of use of the coil section with cold water, it will be necessary to connect the condensate drain fitting on the bottom of the tray of the coil section. The section is equipped with: 2 x 16 mm fittings.

#### **NOTE!**

*All liquids potentially harmful to the environment must be collected in suitable containers and then sent to an authorised disposal or recycling facility. Never lift the heater before draining all the liquid. Regularly inspect the connections to verify that none of the screws or threads subject to loads are damaged. Check that the fin structure is clean and undamaged.*

### CLEANING

The accumulation of dust on the surfaces of the heater reduces the air flow and slows heat dissipation. It is, therefore, important to keep the coils clean following one of the procedures below (or a combination of these):

- Cleaning with a vacuum cleaner.
- Cleaning with compressed air.
- Cleaning with steam.
- Washing or rinsing with water. In the case of hot surfaces covered with grease, first spray the entire heater with an ecological solvent at low pressure. After 10-12 minutes, wash with water at high pressure.

**Cleaning should be done in the opposite direction to normal air flow.**

#### **NOTE!**

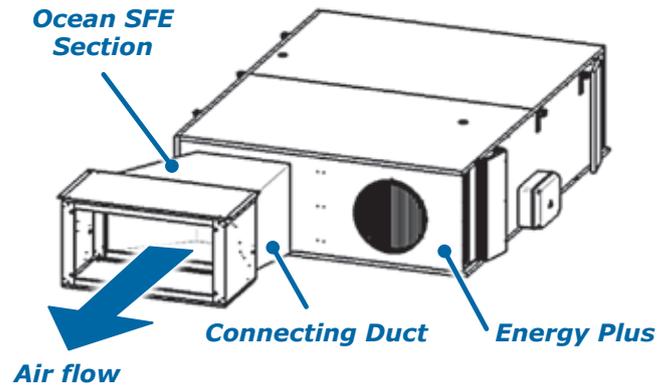
*It is important to keep the nozzle perpendicular to the surface of the fins and at a minimum distance of 150 mm to prevent damage to the fins. Deformed fins can be straightened with a special comb. Make sure to remove all traces of solvent on the body of the pipe with fins in order to prevent the build-up of dust. After cleaning, remove all dust deposits before starting the fan.*

## Ocean Section with pre-filter and electrostatic filter – Ocean SFE

SFE section are equipped with a Crystall electrostatic filter suitable for purifying air. The table below shows the recommended combinations.

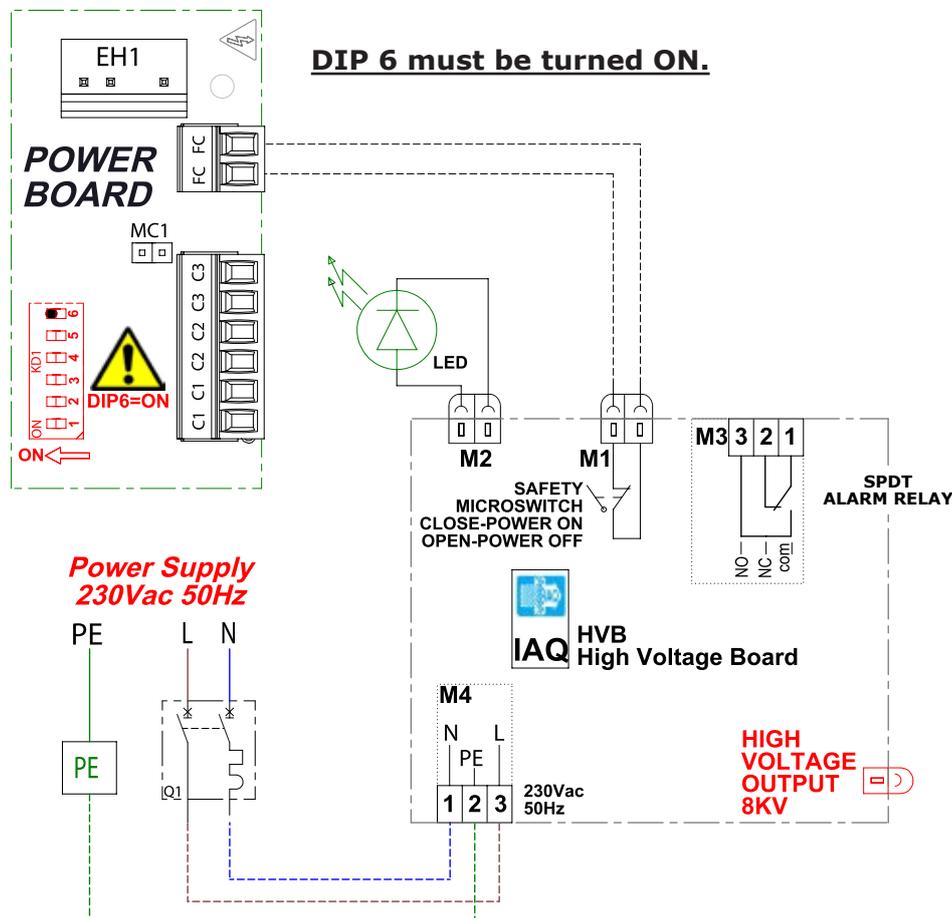
### Installation notes

The Ocean-CRY section can be connected to the Energy Plus unit using the ENP plenum accessory (codes 9022116/9022316/9022416).



FOR HEAT RECOVERY UNIT	CONNECTING DUCT		OCEAN SECTION WITH PRE-FILTER AND ELECTROSTATIC FILTER	
	IDENTIFICATION CODE		IDENTIFICATION CODE	
<b>ENY-P1</b>	<b>ENP 1-2 9022116</b>	<b>+</b>	<b>SFE 1-2 0035012</b>	
<b>ENY-P2</b>	<b>ENP 1-2 9022116</b>	<b>+</b>	<b>SFE 1-2 0035012</b>	
<b>ENY-P3</b>	<b>ENP 3 9022316</b>	<b>+</b>	<b>SFE 3 0035027</b>	
<b>ENY-P4</b>	<b>ENP 4 9022416</b>	<b>+</b>	<b>SFE 4 0035042</b>	

### Wiring diagram



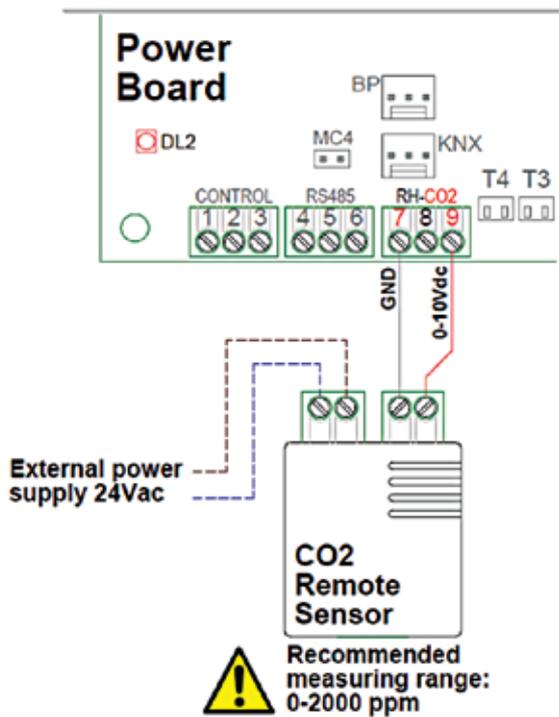
## CO<sub>2</sub> SENSOR (accessory to be installed by the Customer)

The control board of the Energy Plus units is designed to receive a 0-10 V signal from a CO<sub>2</sub> sensor. The characteristics of the sensor that can be connected are:

- Operating range: 0-2000 ppm
- Signal output: 0-10 V

The Customer shall set up the sensor power supply according to the specifications of the selected product. It is usually a power supply with these specifications:

- 24 V AC
- 15-35 V DC.



## CONDENSATE DRAIN SIPHON

The unit has a condensate drain at the bottom to which must be fixed a siphon which can ensure the efficient draining of water during normal operation.

The siphon must always meet the following specifications and be at a minimum gradient of 3°.

The siphon is essential for correct operation of the energy recovery unit as it prevents the infiltration of air and helps to ensure the natural flow of the condensate. The siphon must be filled with water to prevent air from flowing back and impeding proper drainage of the condensate, and, therefore, causing the dangerous overflow of water out of the tray in the heat recovery unit.

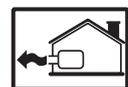
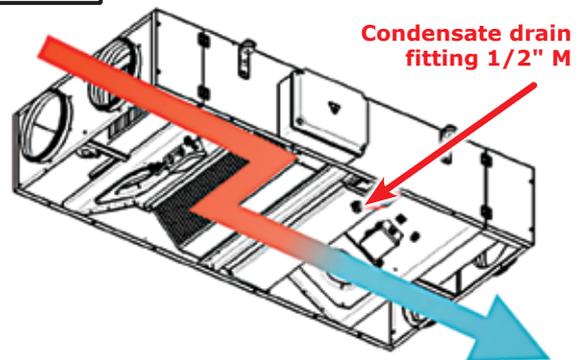
The system must be pressurised as follows:

$$H1 = 2P$$

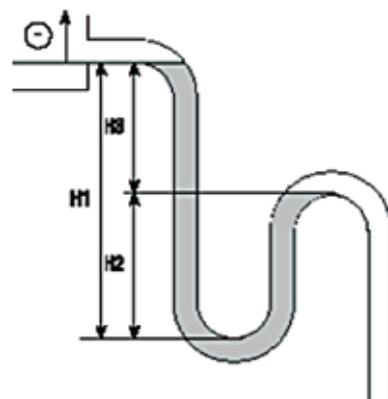
$$H2 = H1 / 2$$

Where P = max operating pressure of the heat recovery unit in mm, approx  
(1 mm approx = 9,81 Pa).

Extracted air



Exhausted air



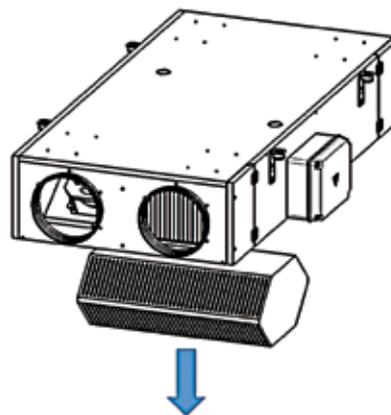
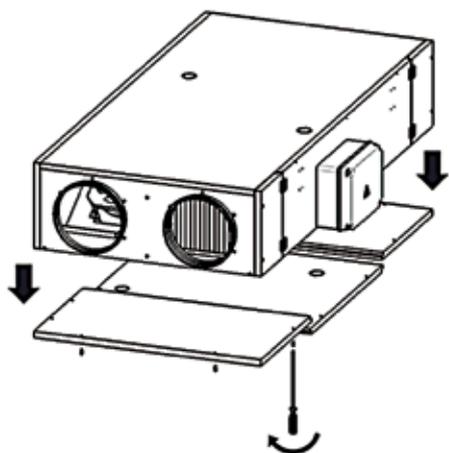
## MAINTENANCE

### **CLEANING THE EXCHANGER AND ACCESS TO THE FILTERS FROM THE SIDE**

To remove the heat exchanger for cleaning, remove the plastic caps on the panel of the heat exchanger. Undo the screws in the panel with a Phillips screwdriver.

These are captive screws and do not, therefore, need to be fully removed from the panel.

Remove the panel from the casing of the unit and take out the heat exchanger. The heat exchanger comprises 1/2/3 units and these must all be taken out for cleaning. Make sure not to touch the fins when handling the heat exchangers, in order to avoid damaging them.

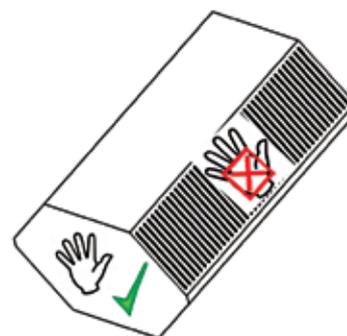


For normal ventilation applications, it is sufficient to clean the inlet and outlet with a brush or water and, if necessary, a neutral detergent. If there is a lot of dirt, you may use compressed air or wash with a jet of water, but only with a flat spray nozzle at a washing pressure of no more than 100 bar. Remember not to aim high pressure jets directly at the plates!

After maintenance, put the heat exchanger and panel back in place. Make sure to tighten all the bolts at a torque of 25 Nm.

### **RECOMMENDED MAINTENANCE SCHEDULE**

**Cleaning the exchanger:** once per season of use (typical).

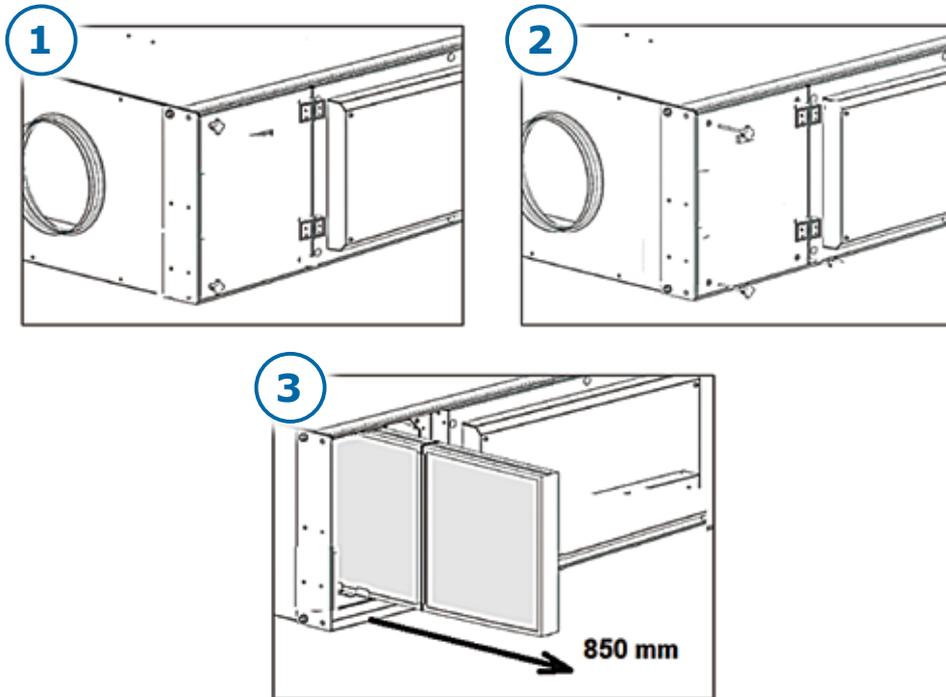


## MAINTENANCE

### REPLACING THE FILTERS (SIDE ACCESS)

Undo the Phillips head screws in the panels of the filters. Open the filter inspection hatch and take the filter out sideways.

Install the new filter and then close the panel and secure it with the Philips screws.



<i>Filters dimension Table</i>		<i>IN</i>	<i>OUT</i>
<i>ENY-P1</i>	<i>Filter, thickness 98, 285x405</i>	<i>F 7</i>	<i>M 6</i>
<i>ENY-P2</i>	<i>Filter, thickness 98, 326x555</i>	<i>F 7</i>	<i>M 6</i>
<i>ENY-P3</i>	<i>Filter, thickness 98, 408x595</i>	<i>F 7</i>	<i>M 6</i>
<i>ENY-P4</i>	<i>Filter, thickness 98, 547x830</i>	<i>F 7</i>	<i>M 6</i>

### RECOMMENDED MAINTENANCE SCHEDULE

Replace the filters after commissioning.

Replacing the filters: this depends on the level of pollution in the air (dust, fumes, etc.).

The units are fitted with differential pressure switches that control the pressure drop of the filter. The default setting of the differential

pressure switch is 120 Pa.

When this value is reached, the control board sends a maintenance alert message to the wall controller and the alarm symbol and filter pictogram appear on the display (see the **T-EP** controller on page 42).



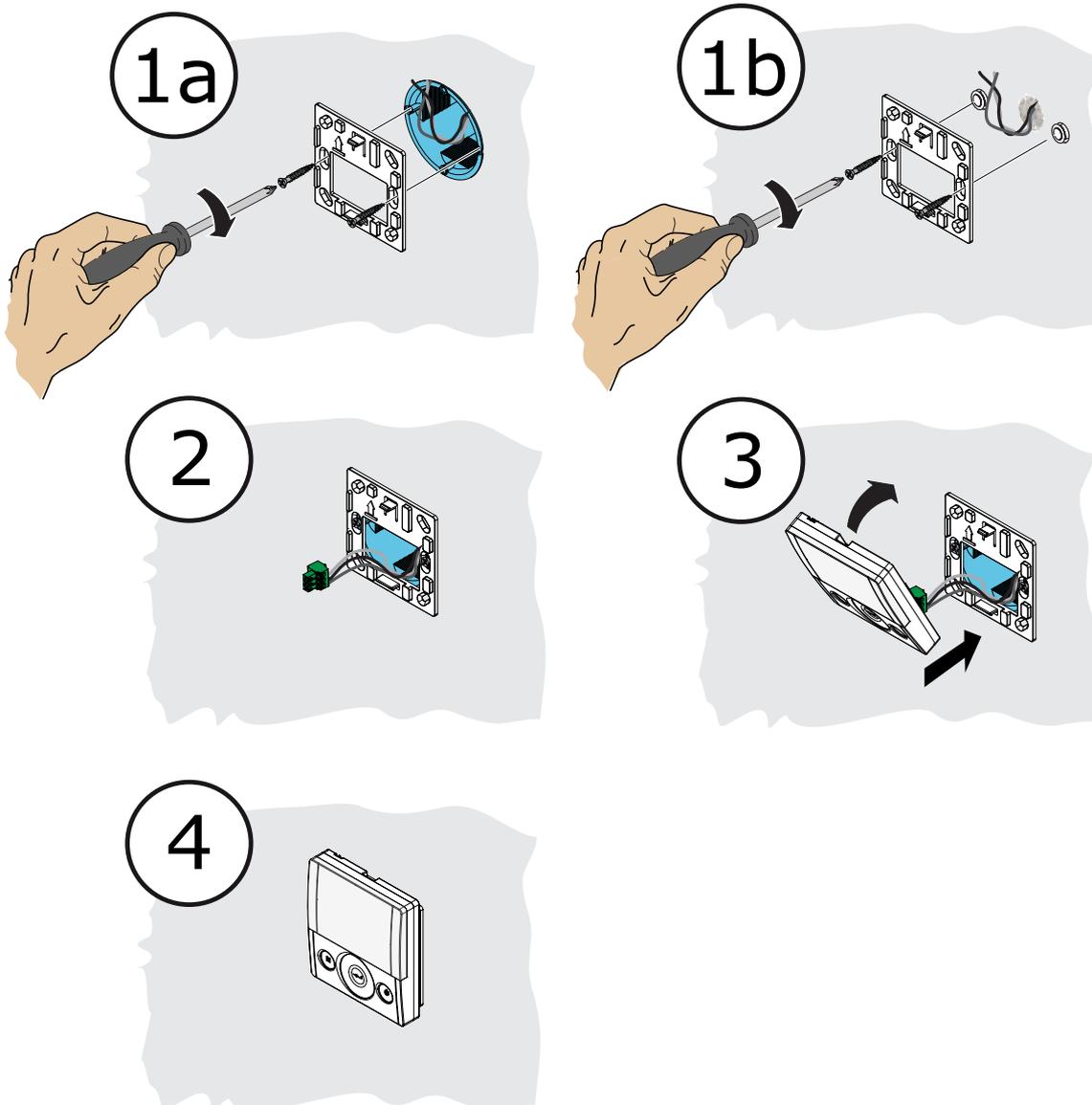
## TROUBLESHOOTING

<b>Malfunction</b>	<b>Possible causes</b>	<b>Corrective action</b>
<b>Unit starts up with difficulty</b>	<i>Low power supply voltage</i>	<i>Check the voltage against that on the engine's rating plate</i>
<b>Insufficient air flow</b> <b>Insufficient pressure</b>	<i>Clogged ducted system and/or extraction points</i>	<i>Clean the ducted system and the intake point</i>
	<i>Formation of frost on the exchanger</i>	<i>Assess the use of the preheating coil</i>
	<i>Underestimated pressure drops</i>	<i>Double-check the operating point on the graph of the recovery unit</i>
	<i>Insufficient rotation speed</i>	<i>Check and recalibrate the operating voltage of the fans</i>
	<i>Dirty filter</i>	<i>Clean or replace the filter media. Note: always use original filter media to guarantee the efficiency of the unit</i>
	<i>Clogged heat exchanger</i>	<i>Clean the mouth of the heat exchan</i>
<b>The air flow decreases after a reasonable period of operation (see above)</b>	<i>Pressure drops upstream and/or downstream of the fan</i>	<i>Check the connections and casing of the unit and restore the initial conditions</i>
	<i>Damaged impeller</i>	<i>Check the impeller. Replace with an original spare part, if necessary</i>
<b>Temperature of air leaving the heat exchanger too low</b>	<i>External air below -5°C</i>	<i>Use a post-heating device</i>
<b>Insufficient performance of the heat exchanger</b>	<i>Build-up of dirt on the fins of the heat exchanger</i>	<i>Clean the heat exchanger</i>
<b>Formation of ice on the heat exchanger</b>	<i>External air below -5°C</i>	<i>Use a preheating device (heater to protect against freezing)</i>
<b>Leaking and/or dripping of water from the casing</b>	<i>Clogged siphon</i>	<i>Clean the siphon</i>
	<i>Missing or improperly fitted siphon</i>	<i>Set up a siphon to standard</i>

**T-EP**



## Wall control installation



# T-EP TOUCH CONTROLLER

## Introduction

This appliance was designed for the remote control of controlled mechanical ventilation units. It is suitable for “**ENERGY PLUS**” units.

The General Settings Menu on the control panel permits access to two settings sub-menus:

1. User Settings Menu: the user can select the mode and receive system status alerts;
2. Technical Menu: the installer can confirm, edit and monitor the operating parameters of the unit.

### ***The User Settings Menu offers these options:***

1. Manual selection of the required fan speed:
  - a) Nominal ventilation (default 100%) - *Speed 4*
  - b) Intermediate ventilation 1 (default 70%) - *Speed 3*
  - c) Intermediate ventilation 2 (default 45%) - *Speed 2*
  - d) Minimum ventilation (default 25%) - *Speed 1*
2. Activation of the Weekly Program <sup>4</sup>.
3. The preheating icon indicates activation of Antifreeze mode.
4. The post-heating icon indicates activation of this mode.
5. The cooling icon indicates use of the dehumidifying unit.
6. An icon alerting to the need to replace the filters appears when the differential pressure switches detect that these are obstructed.
7. A damper bypass icon indicates automatic activation of free-cooling mode.
8. Activation/deactivation of Automatic Control mode.

When the unit is equipped with an advanced centralised control system, flow rate control can be subject to Automatic Control mode.

An icon indicates activation of “Automatic Control mode”.

### ***The Technical Menu offers these options:***

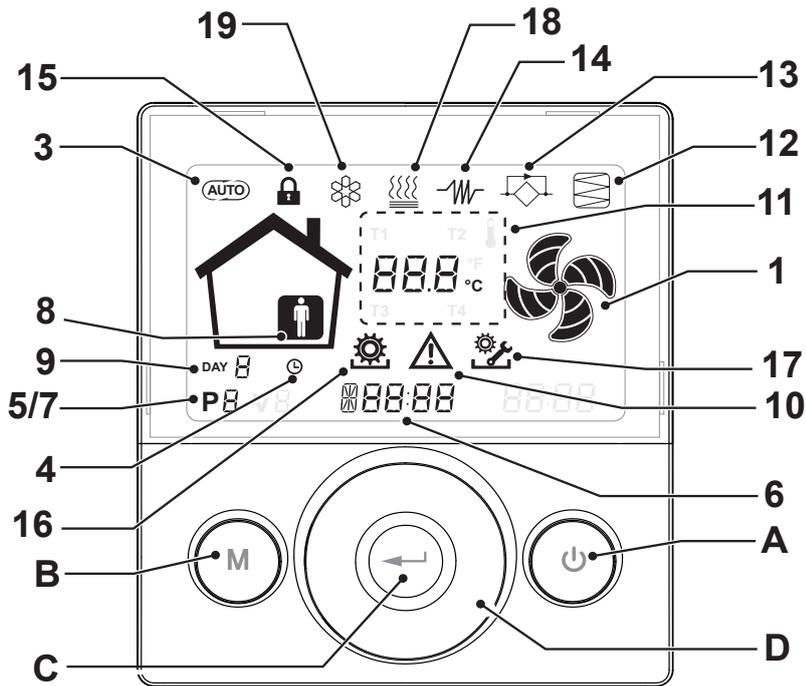
1. Option of confirming or editing the operating parameters.
2. Monitoring the operating sizes.
3. Setting the nominal calibration speed of the fans.
4. Input and Selection of the Weekly Program available to the user.

---

<sup>4</sup> The 4 Weekly Programs can be set by the installer and another 4 weekly programs can be set up according to the user's specific requirements.

The User Settings menu allows the user to enable or disable the Weekly Program configured by the installer.

Overview of the controller



Keys:

<b>A</b>		<ul style="list-style-type: none"> <li>Start and Stop the machine;</li> <li>Access Technical Menu (only authorised staff): when the unit is ON, press the keys  and  at the same time for 5 seconds to access the menu.</li> </ul>
<b>B</b>		<ul style="list-style-type: none"> <li>Access User Menu;</li> <li>Access Technical Menu (only authorised staff): when the unit is ON, press the keys  and  at the same time for 5 seconds to access the menu;</li> <li>Exit Menu.</li> </ul>
<b>C</b>		<ul style="list-style-type: none"> <li>Confirm.</li> </ul>
<b>D</b>		<ul style="list-style-type: none"> <li>Move a finger on the <b>TOUCH PAD</b> to:</li> <li>Increase/decrease the ventilation speed; or the parameters;</li> <li>Scroll between functions.</li> </ul>

Display - Functions

<b>1</b>		<ul style="list-style-type: none"> <li>Manual Ventilation function.</li> </ul>
<b>3</b>		<ul style="list-style-type: none"> <li>Automatic mode.</li> </ul>
<b>4</b>		<ul style="list-style-type: none"> <li>Time setting</li> <li>Current day setting</li> </ul>
<b>5</b>	<b>P</b>	<ul style="list-style-type: none"> <li>Weekly program activation</li> <li>Weekly program deactivation</li> </ul>

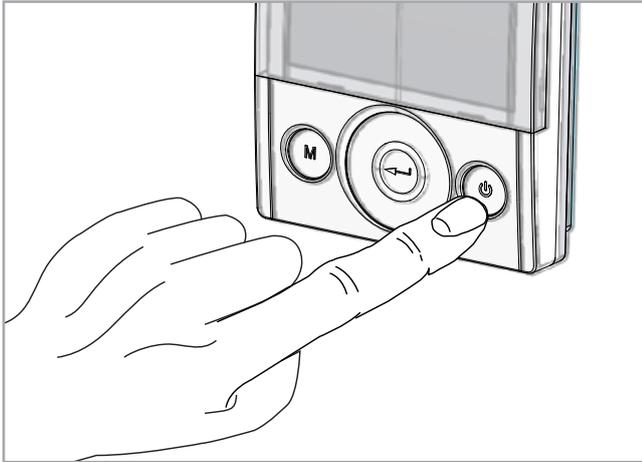
Display - Alerts and alarms

<b>6</b>		<ul style="list-style-type: none"> <li>Display of current time</li> <li>Text field</li> </ul>
<b>7</b>	<b>P8</b>	<ul style="list-style-type: none"> <li>Number of current program</li> </ul>
<b>8</b>		<ul style="list-style-type: none"> <li>Presence of Person</li> </ul>
<b>9</b>	<b>DAY 8</b>	<ul style="list-style-type: none"> <li>Current day</li> </ul>
<b>10</b>		<ul style="list-style-type: none"> <li>Alarm alert</li> </ul>
<b>11</b>	<b>888 °C</b>	<ul style="list-style-type: none"> <li>Temperature Value alert</li> </ul>
<b>12</b>		<ul style="list-style-type: none"> <li>Filter Maintenance/Dirty filter</li> </ul>
<b>13</b>		<ul style="list-style-type: none"> <li>Bypass in use - Free-cooling mode</li> </ul>
<b>14</b>		<ul style="list-style-type: none"> <li>Preheating - Antifreeze mode icon</li> </ul>
<b>15</b>		<ul style="list-style-type: none"> <li>Function lock activated</li> </ul>
<b>16</b>		<ul style="list-style-type: none"> <li>User Menu active</li> </ul>
<b>17</b>		<ul style="list-style-type: none"> <li>Installer settings menu active</li> </ul>
<b>18</b>		<ul style="list-style-type: none"> <li>Post-heating icon (optional)</li> </ul>
<b>19</b>		<ul style="list-style-type: none"> <li>Dehumidifying unit icon (optional)</li> </ul>

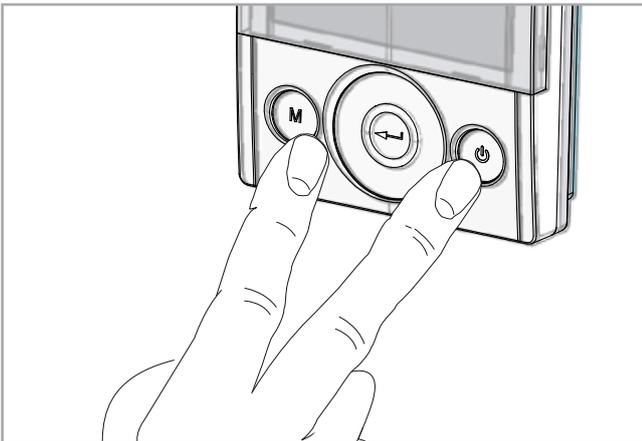


## COMMISSIONING

1. Turn on the appliance at the ON/OFF key on the display.



2. Press the ON/OFF and "M" Menu keys at the same time.



3. The symbol  flashes on the display.

Press **Enter** to confirm .

Use the **TOUCH PAD** to select the symbol "V" and confirm .

Use the **TOUCH PAD** to select fan **V1** or **V2** and confirm .

Set fan **V1** (this is the default intake air fan):

a) Using the **TOUCH PAD**, set the required control voltage with reference to the characteristic data diagrams of the ventilation unit.

b) Confirm using the **Enter** .

Now set fan **V2** following the same procedure above.

### Example of commissioning

Below is an example of selection of the machine that can help to explain calibration:

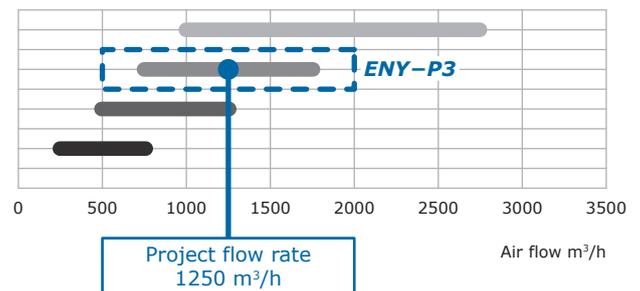
The aim here is to install a primary air ventilation system with very high thermal recovery performance in an average-sized store.

The ventilation unit is to be inserted in a 4-pipe central air conditioning system provided by the owner and used for water terminals.

The store is located in a climate area characterised by cold winter temperatures (climate area E, design temperature  $-8^{\circ}\text{C}$ ).

Useful surface area:	200	$\text{m}^2$
Crowding index:	0,25	pers/ $\text{m}^2$
Circulation flow pro capite:	25	$\text{m}^3/\text{h pers}$
Total circulation flow:	1250	$\text{m}^3/\text{h}$

Primary air is to be used as the energy carrier for summer air conditioning.



The design data for selection of the machine are summarised below:

On the basis of the calculated flow rate, the Energy Plus model is selected as the most suitable, together with all the necessary accessories.

Supply configuration selected:

- Model = **ENY-P3**
- Antifreeze resistance = **EXTERNAL**
- Cooling water coil = **EXTERNAL**

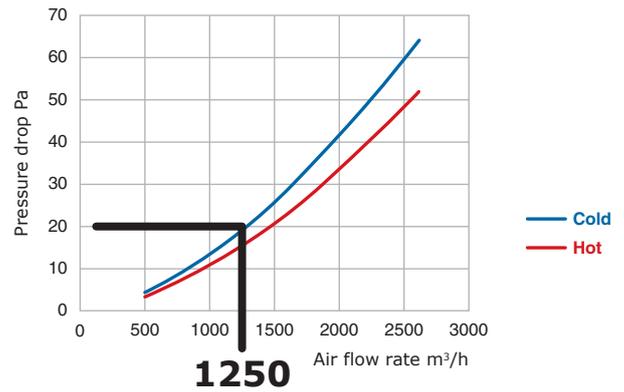
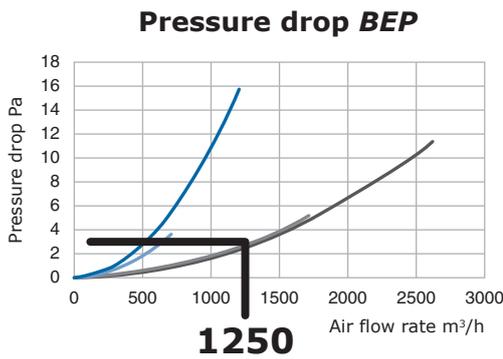
After selecting the most appropriate model in the Energy Plus range, it is possible to identify the parameters for correct calibration of the machine and, therefore, the characteristic performance parameters.

The control voltage at which to control the EC fan motors depends on:

- the design static pressure of the supply and return air circuits of the machine with the addition of the pressure drops due to the accessories.

	<b>SUPPLY</b>	<b>RETURN</b>	<b>COMMENTS</b>
External system pressure losses	200 Pa	100 Pa	-
Antifreeze electric heater	3 Pa	-	IN THE CATALOGUE
Cold Coil	20 Pa	-	IN THE CATALOGUE
Safety Factor	1,05	1,05	It is up to the person who operates the program selection
Available Static Pressure	≈ 230 Pa	≈ 110 Pa	-

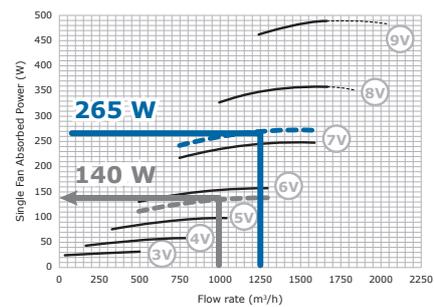
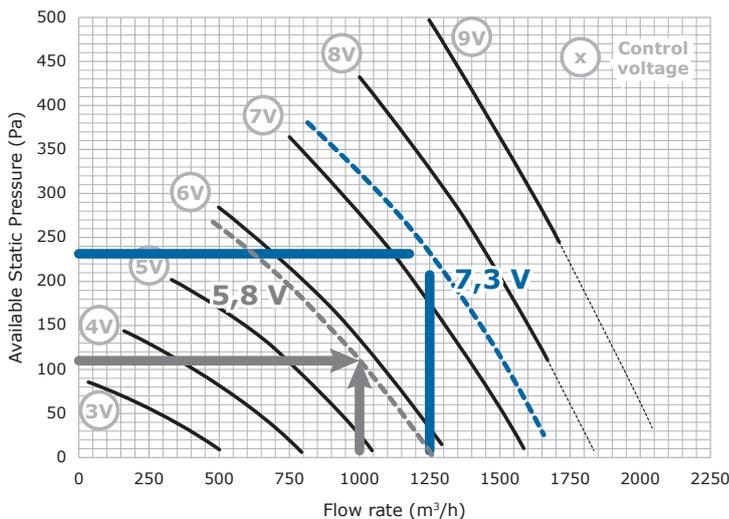
**Air side pressure drop ENY-P3/P4**



- Design imbalance between the supply and return air flow rate. In this case, the supply/return ratio is 80% due to the presence of extractors in the bathrooms and the desire to ensure overpressure in the space in relation to outside.

$$Q_r = 1250 \cdot 0,8 = 1000 \text{ m}^3/\text{h}$$

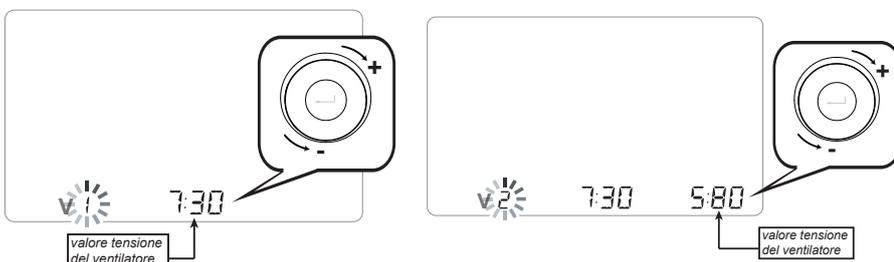
The Flow Rate/Available Static Pressure diagrams allow you to identify the calibration control voltage for the two circuits and estimate the power absorbed by the machine with the resistance disabled.



SUPPLY control voltage: **7,3 V**  
 RETURN control voltage: **5,8 V**

Electrical power absorbed:  
 $P_{el} = 140 + 260 = 400 \text{ W}$

**NOTE:** these are the voltage values for initial calibration and must be correct in relation to the actual flow rate measurements carried out during commissioning of the system.

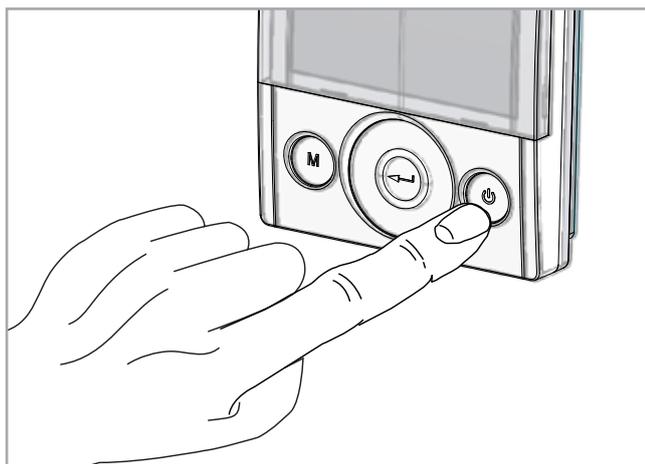


## Setting of the weekly program

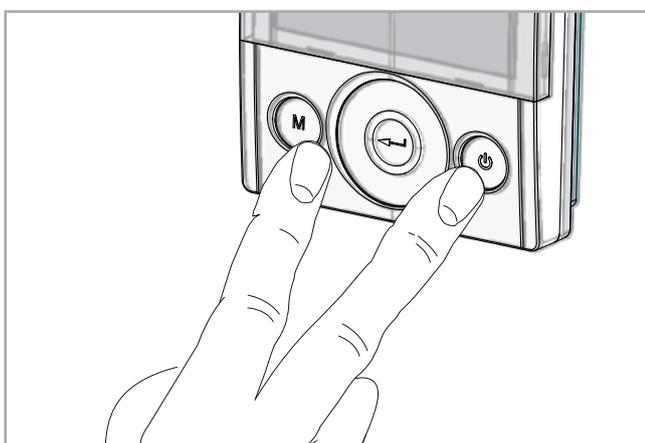
There is a choice of 8 weekly programs: 4 preset programs and 4 free programs that can be modified at will.

### Selection of the preset weekly program: Programs P1-P2-P3-P4

1. Turn on the appliance at the ON/OFF key.



2. Press the ON/OFF and "M" Menu keys at the same time.

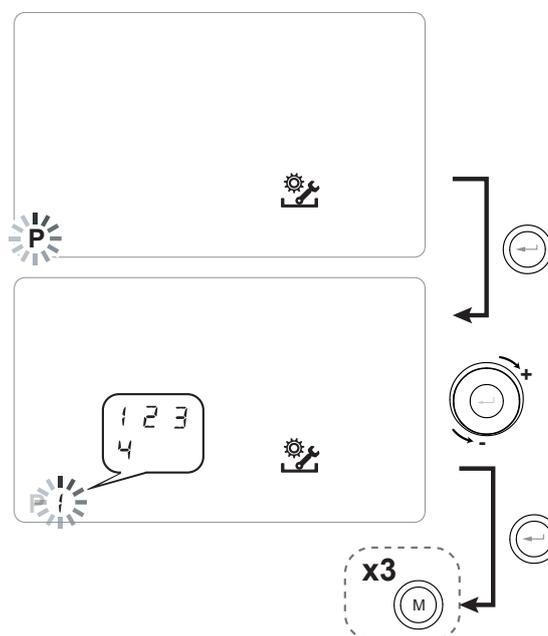


3. The symbol  flashes on the display.

Press **Enter** to confirm .

Use the **TOUCH PAD** to select the symbol "P" and confirm .

4. Now choose the program to be set from P1 - P2 - P3 and P4 (see the schedules on the next page).



5. Press "M"  three times to return to the main screen.

Tables of settings for the preset weekly program

**Weekly Program P1**

DAY	Monday - Friday																							
TIME	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24
SPEED																								
45%																								
70%																								
100%																								

DAY	Saturday - Sunday																							
TIME	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24
SPEED																								
45%																								
70%																								
100%																								

**Weekly Program P2**

DAY	Monday - Sunday																							
TIME	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24
SPEED																								
45%																								
70%																								
100%																								

**Weekly Program P3**

DAY	Monday - Friday																							
TIME	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-24	
SPEED																								
45%																								
70%																								
100%																								

DAY	Saturday - Sunday																							
TIME	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24
SPEED																								
45%																								
70%																								
100%																								

**Weekly Program P4**

DAY	Monday - Friday																							
TIME	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24
SPEED																								
45%																								
70%																								
100%																								

 active status  
 inactive status

### Creation of the free weekly program: Programs P5-P6-P7-P8.

It is possible to create 4 weekly programs at will, according to your habits and needs.

Proceed as follows:

1. Turn on the appliance at the ON/OFF key.
2. Press the ON/OFF and "M" Menu keys at the same time.
3. Use the **TOUCH PAD** to select the installer menu .

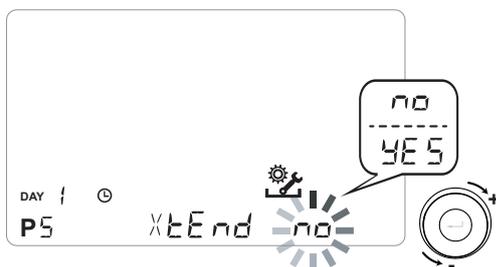
Press the **Enter** key to confirm .

4. Select the symbol "P" and confirm   
Now select the first free program to be created from among P5 - P6 - P7 o P8.

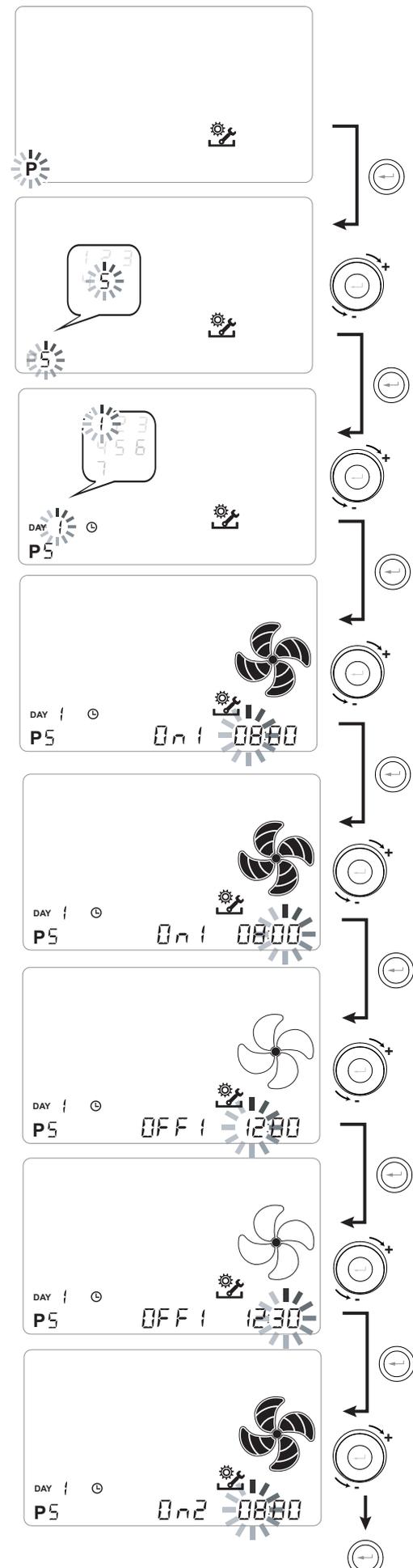
5. When the program number is selected, you are then prompted to select, in order, the day of the week, the start time(s) (ON1, ON2, etc.), and the stop time(s) (OFF1, OFF2, etc.)

**NOTE:** the ON speed relates to the nominal speed; and the OFF speed relates to the holding speed (% low speed selected during installation).

6. After programming the first day, press "M"  to move to the next day; it is possible to extend the program created for the first day to the other days of the week:



If you select "YES" the program is automatically copied to the other days of the week; if instead you select "no", you can then use the **TOUCH PAD** to select a day and repeat the programming process.



**IMPORTANT!:** when a free weekly program is created, the speed associated with each ON status will be the nominal one, while that associated with each OFF status will be the low holding speed set during installation of the controlled ventilation system (See SETTING THE OPERATION PARAMETERS).

**NOTE:** once created, the free weekly programs can be modified as necessary at any time.

**Weekly Program P....**

DAY	Monday - Friday																								
TIME	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	
SPEED																									
Low																									
Nominal																									

DAY	Saturday - Sunday																								
TIME	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	
SPEED																									
Low																									
Nominal																									

**Weekly Program P....**

DAY	Monday - Friday																								
TIME	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	
SPEED																									
Low																									
Nominal																									

DAY	Saturday - Sunday																								
TIME	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	
SPEED																									
Low																									
Nominal																									

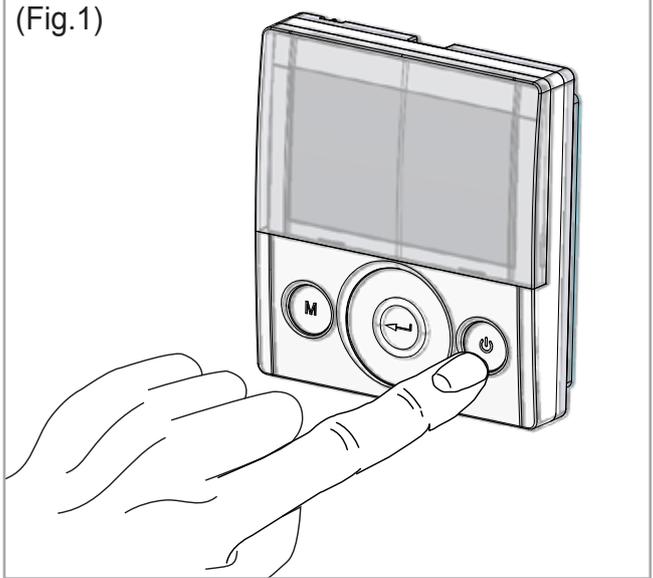
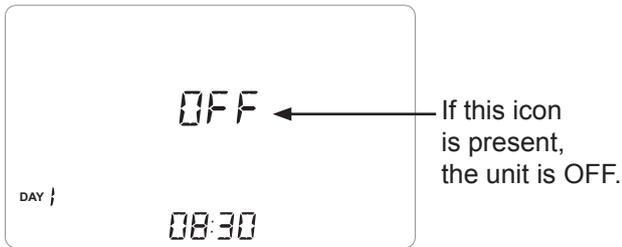
**IMPORTANT!:** complete the table(s) with the configuration of the program created.

- active status
- inactive status

## OPERATIONAL PROCEDURES

### STARTING AND STOPPING THE ENERGY PLUS

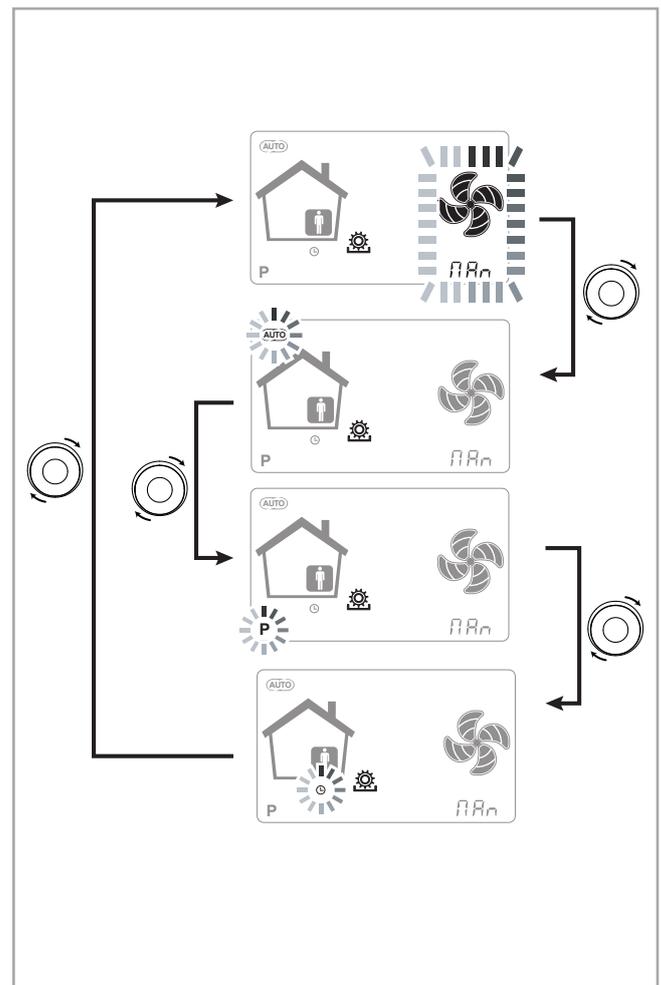
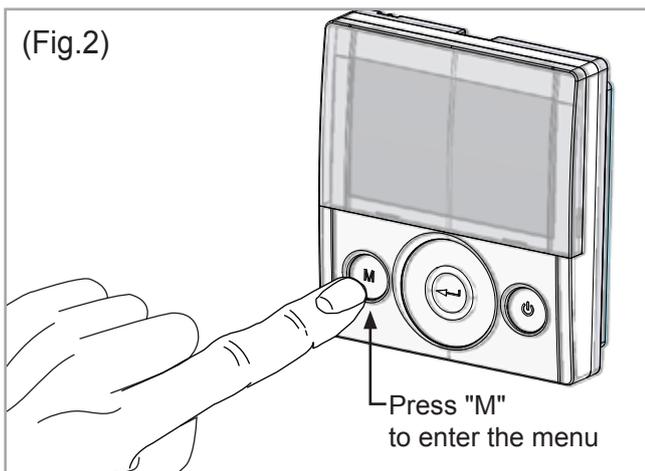
To turn the unit on, press the ON/OFF power key as shown in the figure to the right (Fig. 1).



### SELECTING THE OPERATING MODE ON THE T-EP CONTROLLER

Press “M” to access the User Settings Menu (Fig. 2). The following options are available:

- MANUAL VENTILATION FUNCTION;
- **AUTO** AUTOMATIC FUNCTION;
- WEEKLY PROGRAM ACTIVATION;
- CURRENT DAY and TIME SETTING.



Use the **TOUCH PAD**  to pass from one function to another.

To access the desired function, please press the confirmation button .

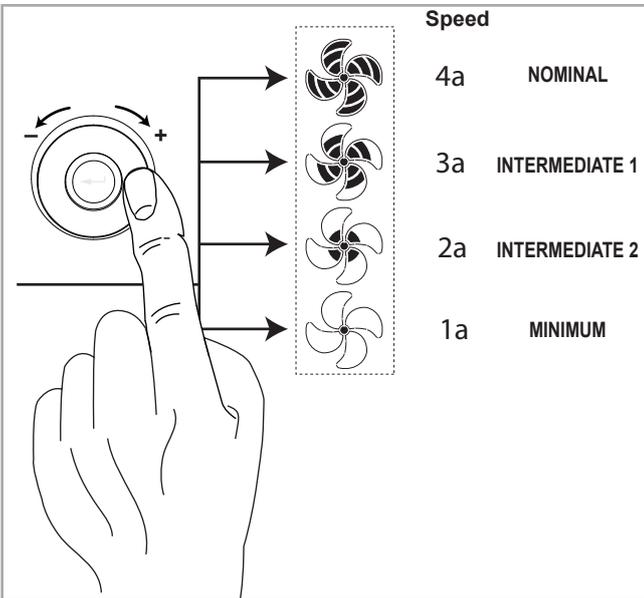
• **MANUAL VENTILATION FUNCTION;**

Press "M" and scroll with the **TOUCH PAD** until the "Manual ventilation" function starts flashing.

Then press "Confirm" .



With the "Manual ventilation" function enabled, the speed of the fan at the various points can be adjusted by turning a finger round on the **TOUCH PAD**. Turning a finger clockwise on the pad increases the speed of the fan while moving a finger anti-clockwise decreases the speed of the fan.

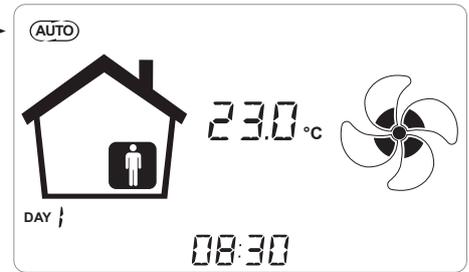


• **AUTOMATIC FUNCTION;**

Press "M" and scroll with the **TOUCH PAD** until the "AUTOMATIC" function starts flashing.

Then press "Confirm" .

If this icon is present, the operating mode is AUTOMATIC

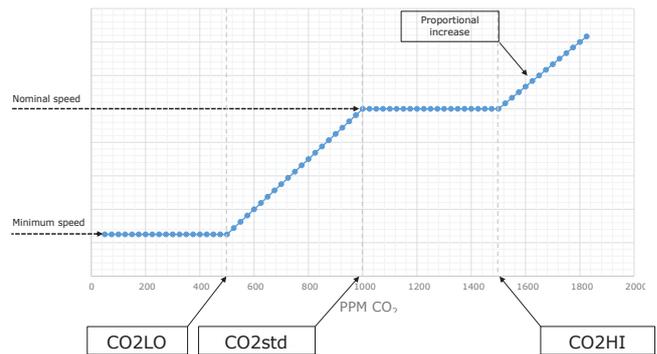


The "Automatic" function can be enabled only when the units are equipped with advanced centralised control systems.

The advanced centralised control systems are ready for connection of a CO<sub>2</sub> Sensor (accessory not supplied).

When "Automatic" mode is enabled, an automatic control loop adapts the fan speed according to the desired air quality.

FLOW MANAGEMENT LOGIC CHART IN RELATION TO PPM CO<sub>2</sub>

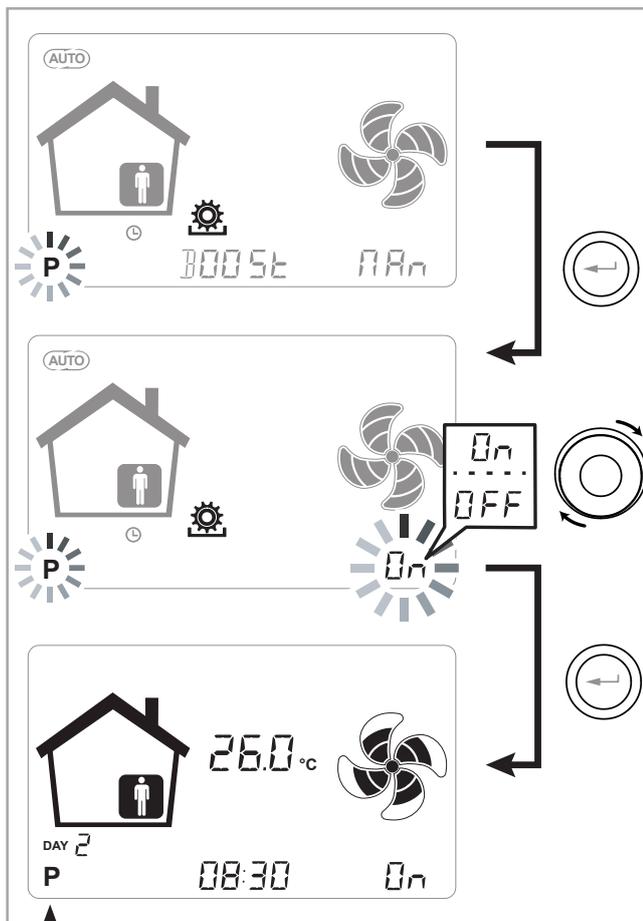


### WEEKLY PROGRAM ACTIVATION

Press "M" ; scroll with the **TOUCH PAD** until the function "P" starts flashing and confirm by pressing "Confirm" .

Then scroll with the wheel to activate or deactivate the program.

Then press "Confirm" .



If this icon is present, it means that a scheduled program is active.

### SETTING THE CLOCK AND DAY OF THE WEEK

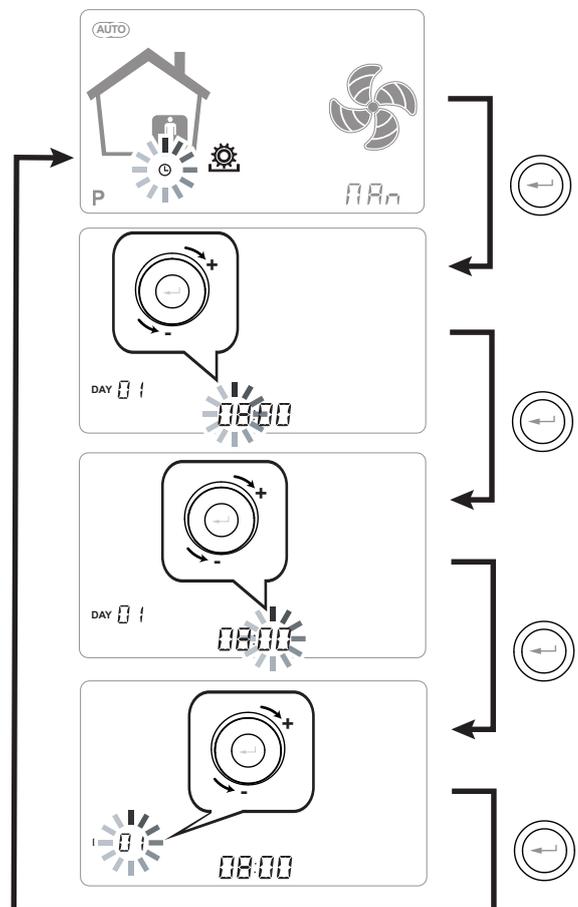
Press "M"; scroll with the wheel until the "clock" icon starts flashing .

Then press "Confirm" .

Scroll with the wheel to set the hour.

Press "Confirm"  and scroll again to set the minutes.

Press "Confirm"  and scroll again to set the current day.



+ Use the **TOUCH PAD** to increase or decrease the value

 Use the Confirm button to confirm and move to the next setting

Set the day of the week as follows:

day 1 = Monday / day 2 = Tuesday

day 3 = Wednesday ... .. day 7 = Sunday

## • ANTIFREEZE FUNCTION

### • With Electric Resistance

In the event that the unit is installed in a cold climate, we recommend the use of versions with an electric antifreeze resistance on the external air intake circuit.

The electric resistances available for Energy Plus units preheat the air entering the exchanger in order to avoid freezing of the humid air extracted and discharged by the exchanger in the circuit opposite.

In fact, when the external air drops below the critical temperature, posing the risk of freezing of the discharged air, the resistance is activated and modulates the heat output to keep the temperature of the discharged air within the desired fluctuation range.

The electric resistances should be selected in order to maintain the minimum conditions of indoor comfort at outdoor temperatures down to  $-10^{\circ}\text{C}$ , and in order to avoid the degenerative formation of ice at discharge down to  $-15^{\circ}\text{C}$  outside.

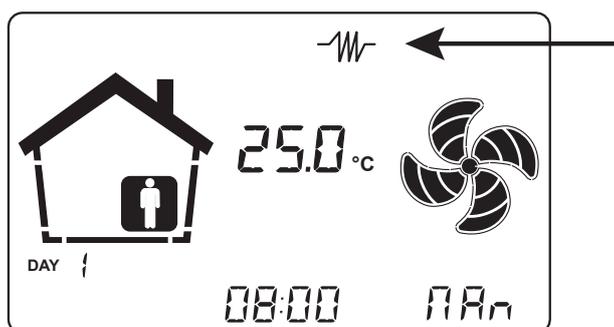
The electric resistance is fitted with a safety thermostat that turns off the unit in case of uncontrolled heating. In case the resistance does not start up, instead, the unit will turn off if the intake air temperature falls below  $5^{\circ}\text{C}$ .

**Activation of the resistance as a result of the antifreeze function is represented by the icon .**

### • Without Electric Resistance

In case the unit is without an electric antifreeze resistance, the **Energy PLUS** unit has preventive operation logic which, below  $-5^{\circ}\text{C}$ , automatically sets running of the intake fan at minimum for 10 minutes every hour.

Also, in case the temperature falls below  $-10^{\circ}\text{C}$ , the unit stops automatically and an alert appears on the display of the controller: “ **FROST** ”.



### • **FREE COOLING FUNCTION**

There can be climatic conditions during the year that make it impractical to recover heat from extracted air for treating fresh air from outside.

For example, in midseason, the outdoor air temperature can be lower than the indoor air temperature due to solar and internal factors, and this tends to occur when the indoor temperature is between 22 and 26°C so there is more of a need for cooling than for heating. In this case it is advisable to use free-cooling, i.e. fresh air from outdoors to cool for free, bypassing the heat recovery unit. Conversely, it is possible to use fresh air for heating during a change in season, in which case the process is known as free-heating.

Energy Plus units are equipped with a bypass damper that disables use of the recovery exchanger to permit free-cooling (or free-heating).

The damper is controlled on the basis of a logic subject to the feedback of the integrated temperature probes.

The logic is as follows:

The indoor air temperature setpoints of the air conditioning system in winter and summer are defined in order to maintain conditions of comfort:

$t_{\text{heating}} \rightarrow$  normally  $t_{\text{heating}} = 20^{\circ}\text{C}$

$t_{\text{cooling}} \rightarrow$  normally  $t_{\text{cooling}} = 26^{\circ}\text{C}$

The following are also defined:

$t_i$  = internal air temperature (return air)

EAT = External air temperature

#### **FREE-COOLING CONDITION**

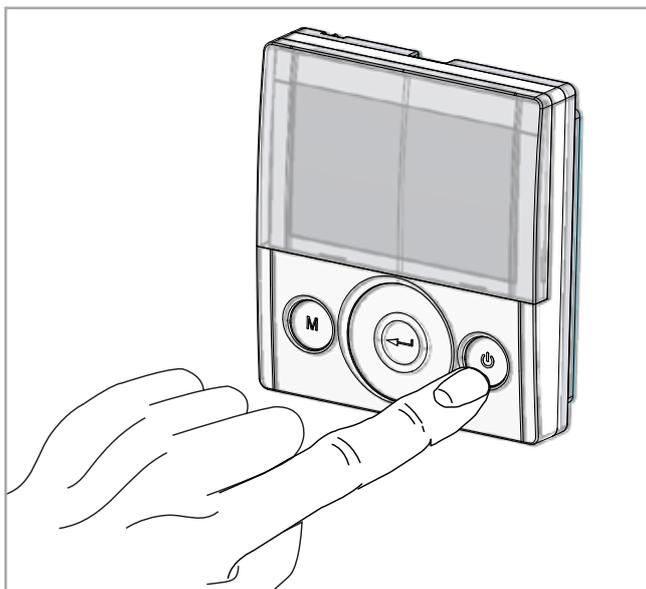
$\text{EAT} > t_{\text{heating}}$  and simultaneously  $t_i > \text{EAT}$

#### **FREE-HEATING CONDITION**

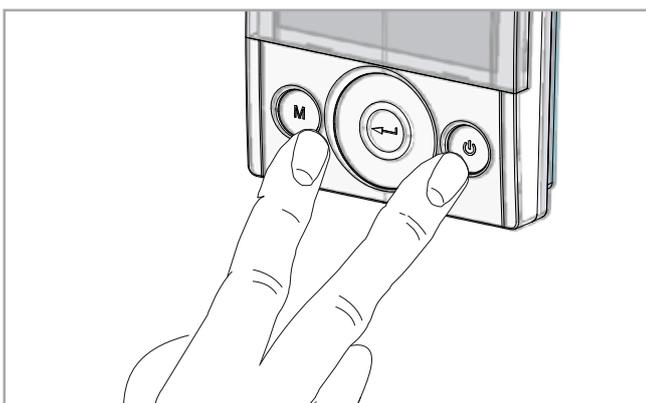
$\text{EAT} < t_{\text{cooling}}$  and simultaneously  $t_i < \text{EAT}$

## TECHNICAL MENU

1. Turn on the appliance at the ON/OFF key.



2. Press the ON/OFF and "M" Menu keys at the same time.



3. The symbol  flashes on the display; Use the **TOUCH PAD** to choose the desired function between:

- Installer menu  (initial setting menu);
- "PAr" parameters;
- rEAd menu;

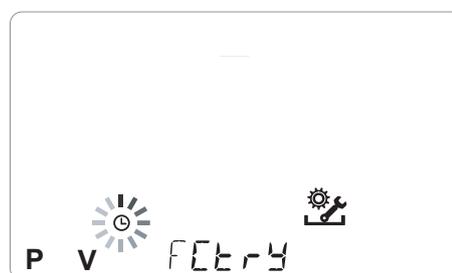
Press the Enter key to confirm .

### • Installer menu

The symbol  flashes on the display when the installer menu is open; Use the **TOUCH PAD** to choose the desired function between:

- day and time setting  ;
- setting/initial configuration of the fans "V";
- Selection/Setting of the chosen weekly program "P";
- FCtry menu (FACTORY);

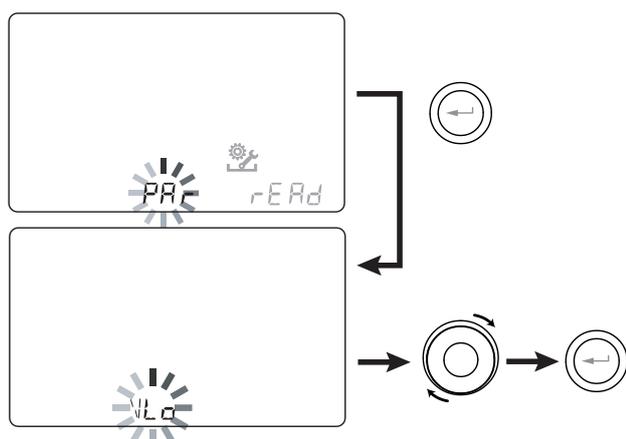
Press the Enter key to confirm .



**NOTE: the FACTORY menu is for the exclusive use of the manufacturer. Password-protected menu.**

Press the "M" button once to return to parameter selection; to exit the menu, press the "M" button 3 times.

### • “PAR” parameters menu



This menu allows you to modify the operating parameters of the appliance.

With the controller **“ON”**, press **“M”** and ON/OFF simultaneously for 3 seconds.

Select the **“PAR”** menu using the TOUCH PAD and confirm with **“Enter”**.

Select the parameter to be changed using the TOUCH PAD and confirm with **“Enter”**. Once you have selected the parameter, the value will appear on the display.

The value can be modified using the TOUCH PAD.

Press the **“M”** button once to return to parameter selection; to exit the menu, press the **“M”** button 3 times.

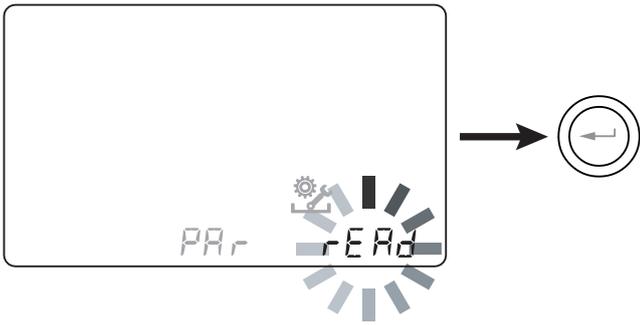
Table 1

<b>FUNCTION</b>	<b>DESCRIPTION</b>	<b>RANGE</b>	<b>DEFAULT</b>
<b>VLO</b>	Minimum control voltage	-10% ÷ 0	see table 2
<b>VHI</b>	Maximum control voltage	0 ÷ 10%	see table 2
<b>nLO</b>	Minimum speed	-10% ÷ 0	see table 2
<b>nHI</b>	Maximum speed	0 ÷ 10%	see table 2
<b>PStd</b>	Percentage of standard modulation of nominal speed	100% ÷ 110%	100%
<b>PMEd</b>	Percentage of intermediate modulation	35% ÷ 70%	45%
<b>PnGt</b>	Percentage of night modulation	45% ÷ 100%	70%
<b>Phol</b>	Percentage of minimum - holiday modulation	0 ÷ 35%	25%
<b>TCOOL</b>	Temperature setpoint for free-cooling/climate with cold coil	min 24°C	26°C
<b>THEAt</b>	Temperature setpoint for free-cooling/climate with post-heating coil	min 18°C	20°C
<b>CO2hi</b>	Maximum CO <sub>2</sub> level	400 ÷ 600 ppm	500 ppm
<b>CO2lo</b>	Minimum CO <sub>2</sub> level	1500 ÷ 2000 ppm	1500 ppm
<b>CO2st</b>	Nominal CO <sub>2</sub> level	900 ÷ 1100 ppm	1000 ppm

Table 2

<b>Unit model</b>	<b>VLO (Volt)</b>	<b>VHI (Volt)</b>	<b>nLO (rpm)</b>	<b>nHI (rpm)</b>
ENERGY-PLUS 1	4	10	800	2960
ENERGY-PLUS 2	3	8,5	500	3220
ENERGY-PLUS 3	3	9	500	2630
ENERGY-PLUS 4	3	9	500	2090

• “Read” menu



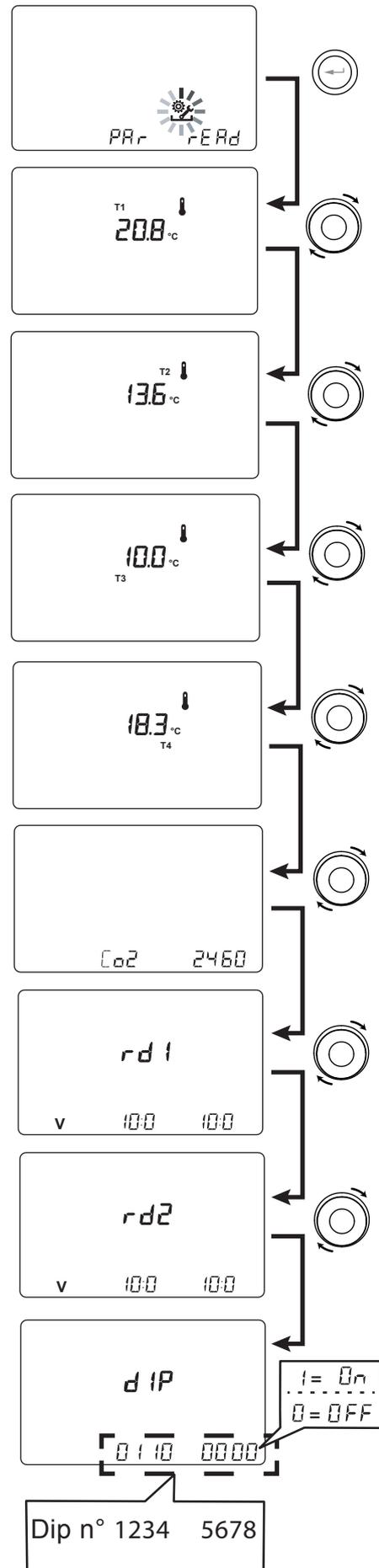
This menu allows you to read some the operating parameters of the appliance

With the controller “ON”, press “M” and ON/OFF simultaneously for 3 seconds.

Select the “rEAd” menu using the TOUCH PAD and confirm with “Enter”.

Select the parameter to be read using the TOUCH PAD. Once you have selected the parameter, the value will appear on the display. Press the “M” button once to return to parameter selection; to exit the menu, press the “M” button 3 times.

	<b>DESCRIPTION</b>
<b>T1</b>	value of external air temperature probe T1
<b>T2</b>	value of intake air temperature probe T2
<b>T3</b>	value of stale extracted air temperature probe T3
<b>T4</b>	value of disposed air temperature probe T4
<b>CO2</b>	value of CO <sub>2</sub> detected
<b>RD1</b>	Fan voltage
<b>RD2</b>	fan speed
<b>DIP</b>	Configuration of power board dip switch



## ALARMS

Below is a table for troubleshooting the faults that may occur during operation of the machine.

<b>Type of Alert</b>	<b>Description of Fault</b>	<b>Notes/Solution</b>
	General Alarm.	Present in case of any fault.
 	FAN thermal contact. One of the fans is not working.	It is recommended to enter the <b>Read</b> Menu to check the FAN operating parameters and identify which FAN is not working.
	FAN voltage/speed limits exceeded.	It is recommended to enter the <b>Read</b> Menu to check the FAN operating parameters and identify which FAN is not working.
	Faulty temperature probe.	It is recommended to enter the <b>Read</b> Menu to check the probe data and identify which probe is faulty.
	Faulty humidity/CO <sub>2</sub> probe.	It is recommended to enter the <b>Read</b> Menu to check the probe data and identify which probe is faulty
	Replacement of filters (alerted by differential pressure switches) .	Clean or replace the filters of the machine.
	IAQ filter fault.	
	Electric defrost resistance fault.	Check the resistance reset thermostat; Check the electrical connections; It is recommended to enter the <b>Read</b> Menu to check the probe data and identify which probe is faulty.
<b>FROST</b>	Antifreeze Alarm.	The outside temperature is below -10° C; Consider installing an antifreeze system (electric resistance).
 	T-EP Controller Error.	Check the electrical connections between the controller and the power board of the machine.

Oggetto: **Dichiarazione di conformità UE**  
Object: **EU Declaration of conformity**

**La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante.**  
**This declaration of conformity is issued under the exclusive responsibility of the manufacturer.**

Prodotto: Energy Plus - Recuperatori di Calore  
Product: Energy Plus- Heat Recovery Units

Modello: ENY-P1-S, ENY-P2-S, ENY-P3-S, ENY-P4-S / ENY-P1-P, ENY-P2-P, ENY-P3-P, ENY-P4-P  
Pattern: ENY-P1-S, ENY-P2-S, ENY-P3-S, ENY-P4-S / ENY-P1-P, ENY-P2-P, ENY-P3-P, ENY-P4-P

**al quale questa dichiarazione si riferisce, è conforme alle seguenti norme:**  
**to which this declaration relates is in conformity with the following standards or other normative document(s):**

EN 60335-1 (2012) + A1 (2004) + A2 (2006) + A11 (2014) + A12 (2006) + A13 (2008) + A14 (2010) + A15 (2011)	• Sicurezza degli apparecchi elettrici d'uso domestico e similare - Norme generali  • <i>Safety of household and electrical appliances - General requirements</i>
EN 60335-2-40 (2003) + A11 (2004) + A12 (2005) + A1 (2006) + A2 (2009) + A13 (2012)	• Sicurezza degli apparecchi elettrici d'uso domestico e similare - Parte 2 : Norme particolari per le pompe di calore elettriche, per i condizionatori d'aria e per i deumidificatori • Household and similar electrical appliances – Safety – Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers
EN 55014-1 (2006) +A1 (2009) + A2 (2011)	• Limiti e metodi di misura delle caratteristiche di radiodisturbo degli apparecchi elettrodomestici, e similari a motore o termici, degli utensili e degli apparecchi elettrici • <i>Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for households and similar purposes, electric tools and similar electric apparatus</i>
EN 61000-3-2 (2014)	• Compatibilità elettromagnetica (EMC) - Parte 3: Limiti. - Sezione 2: Limiti per le emissioni di corrente armonica (apparecchiature con corrente di ingresso $\leq 16$ A per fase) • <i>Electromagnetic compatibility (EMC)- Part 3: Limits. - Section 2: Limits for harmonic current emissions (equipment input current <math>\leq 16</math> A per phase)</i>
EN 61000-3-3 (2013)	• Compatibilità elettromagnetica (EMC) - Parte 3: Limiti. - Sezione 3: Limitazione delle fluttuazioni di tensione e dei flicker in sistemi di alimentazione in bassa tensione per apparecchiature con corrente nominale $\leq 16$ A. • <i>Electromagnetic compatibility (EMC) - Part 3: Limits. - Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current <math>\leq 16</math> A</i>
EN 55014-2 (1997) + A1 (2001) +A2 (2008)	• Requisiti di immunità per apparecchi elettrodomestici, utensili e degli apparecchi elettrici similari • <i>Immunity requirements for household appliances, tools and similar apparatus. Product family standard</i>
Reg. N. 327/2011	Regolamento (UE) recante modalità di applicazione della Direttiva 2009/125/CE in merito alle specifiche per la progettazione ecocompatibile di ventilatori la cui potenza elettrica in ingresso è compresa tra i 125 W e 500 kW Regulation (EU) implementing Directive 2009/125/EC with regards to eco design requirements for fans driven by motors with an electric input power between 125 W and 500 kW
EN 50581 (2012-09)	RoHS "Documentazione tecnica per la valutazione dei prodotti elettrici ed elettronici in relazione alla restrizione delle sostanze pericolose" Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

**L'oggetto della dichiarazione di cui sopra è conforme alla pertinente normativa di armonizzazione dell'Unione.**  
**The object of the declaration described above is in conformity with the relevant Union harmonization legislation.**  
**2014/35/UE 2014/30/UE 2006/42/EC 2009/125/EC 2011/65/EC**

Il fascicolo tecnico è costituito presso: Sabiana S.p.A. Via Piave 53, 20011 Corbetta (MILANO-ITALY)  
The technical file is made at: Sabiana S.p.A. Via Piave 53, 20011 Corbetta (MILANO-ITALY)

Corbetta, 13/07/2016

Nicola Binaghi  
Presidente

