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OPERATING & MAINTENANCE MANUAL

FlowFAST H

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00020EN Rev.09 – 12/2012 **(ORIGINAL INSTRUCTIONS)**

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CONTENTS

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1 GENERAL

FLOWFAST H horizontal laminar airflow benches according to ISO 14644-1 Class 5 are the most advanced alternative to sterilize rooms providing highly decontaminated working areas.

These cabinets have been specifically designed for the protection of the manipulated product from the external and from cross contamination; they absolutely must not be used for the handling of contaminants as viruses, pathogens and aggressive dusts since the filtered, dust-free and sterile air produced by HEPA filter runs over the manipulated product and afterwards the operator.

Especially suitable for applications such as:

- Sterile manipulation
- Sterility testing
- Microbiology
- Preparation of culture media
- Preparation of ophtalmic solutions
- TPN Preparation
- Assembly of equipment
- Floriculture

Furthermore FlowFAST H cabinets fulfil the armonized standards EN 61010-1 as well as EN 61326 according to the applicable European directives regarding the CE marking.

FlowFAST H cabinets comply with the above-mentioned standards ONLY if the instruments connected to the electrical socket positioned inside the work chamber are "CE" marked or in any case it meets the above mentioned standards aiming to avoid any electromagnetic interference.

All FASTER's cabinets are provided with high insertion loss filters.

Faster s.r.l. cannot be held responsible for malfunctions, damages to people or property due to non-compliance, poor or no maintenance or improper use of the cabinet.

IMPORTANT: FLOWFAST H cabinets must absolutely not be used for handling pathogenic materials.

2 INSTALLATION

2.A INSTRUCTIONS AND CHECKS ON DELIVERY

Considering the critical nature of the use of the FLOWFAST H cabinet and the need to keep it in optimum condition, installation is very important.

FLOWFAST H cabinets are positioned on a pallet, wrapped in an extensible film and contained in a package of multi-layer strapped cardboard.

After placing the cabinet in its site of use, opening the package and removing the extensible film, check that the equipment has not suffered any dents or scratches due to transport or improper handling of the package.

In case of any further transport, packing and storage by the user after the initial period of use (e.g.: change of laboratory or factory), contact the technical assistance service or the distributor for more accurate and precise instructions or for assistance by specialized technicians.

2.B INSTALLATION REQUIREMENTS

Install the cabinet away from drafts and heat sources (radiators, ventilators/convectors), to ensure proper functioning.

Install the cabinet in a well-ventilated room with a low degree of dust.

The distance between the cabinet and the room ceiling should be at least 10 cm.

Place the cabinet away from doors and windows, which may cause malfunctions

Place the cabinet in places where there is little human traffic.

The door of the room should be in such a position relative to the cabinet that drafts are prevented.

Use the cabinet whenever possible, together with the external exhaust system package, which should always be sheltered from rain.

The temperature should never fall below 0°C to prevent the humidity present in the filtering screen from freezing, which might damage the filters' meshes:

- max. temperature: 40 °C
- max. humidity: 80 % at 30°C, linear drop in relative humidity down to 50% relative humidity at 40°C.

Before connecting the cabinet to the mains power supply, check the necessary voltage and power indicated on the plate near the power cable.

The room must be equipped with an earth connection and connections to the gas and/or vacuum networks, and an air exhaust duct must be installed outside the building.

For the connection to the gas and/or vacuum networks, read carefully chapter 2C.

The installation is made by technicians authorized by Faster s.r.l.

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2.C ELECTRIC/GAS CONNECTIONS

The electrical connection of FLOWFAST H cabinet is made by connecting the power cable located on the upper of the right side of the cabinet to a 230V, 50 Hz outlet (if not distinct voltages/frequencies are shown on the label stuck near the power cable)

If stipulated by local legislation, insert upstream of the power cable an automatic protection overload switch provided with a differential relay, with a rated switching voltage no greater than 30 mA.

The right side of the bench can be equipped with one or more gas/vacuum intakes with manual tap.

The connection with the gas/vacuum intake is made according to the type of connection: town gas or industrial gas (air, vacuum, nitrogen, etc.).

The cabinet must be connected with the town gas line through an approved conduit, for safety reasons.

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Techincal Features Table

Description	Unit	FlowFAST H 09	FlowFAST H 12	FlowFAST H 15	FlowFAST H 18
Overall Dimensions (L x H x P)	mm	945x1195x925	1250x1195x925	1555x1195x925	1860x1195x925
Usefull dimensions (L x H x P)	mm	885x734x600	1190x734x600	1495x734x600	1800x734x600
Weight	Kg	95	128	175	188
Noise level	dB (A)	58	58	58	58
Lighting level	Lux	>800	>800	>800	>800
Main voltage	V	230V AC 2P+T	230V AC 2P+T	230V AC 2P+T	230V AC 2P+T
Frequency	Hz	50	50	50	50
Maximum power consumption	W	700	900	1400	1400
Current	A	3	3.5	6	6
Electrical class		1	1	1	1
Protection level		IP20	IP20	IP20	IP20
Internal outlet (maximum current for all the sockets: 4A)		2P+T 230V 4A	2P+T 230V 4A	2P+T 230V 4A	2P+T 230V 4A
Fluorescent lamps	W	2x18	2x30	2x36	2x36

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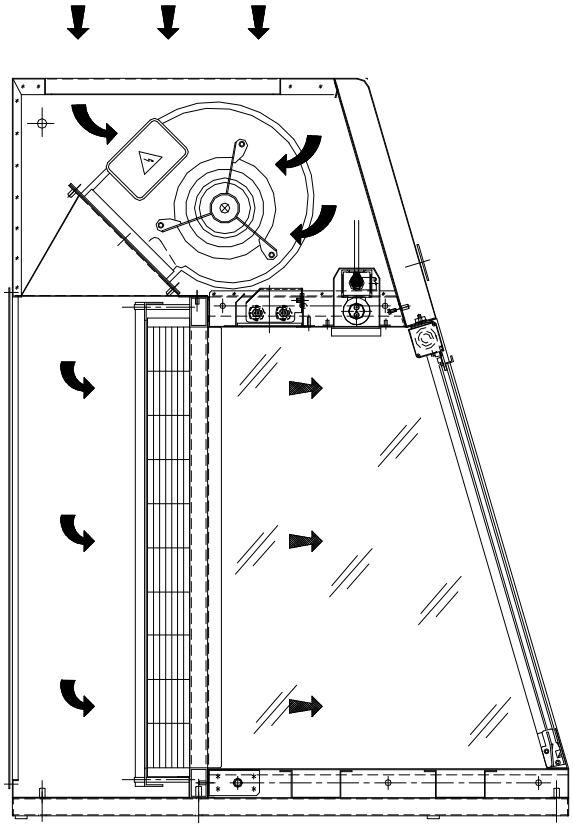
3 OPERATION PRINCIPLES

The system described herein - FLOWFAST H horizontal laminar airflow cabinet - works as follows.

The air is sucked in by the motor-fan placed in the upper part of the cabinet through a pre-filter, which eliminates the dust in order to protect the motor-fan and preserve the HEPA filter from premature clogging.

The air is subsequently pushed under pressure into the plenum of the cabinet through the HEPA filter placed in the back-side of the cabinet, and then into the working area in a horizontal laminar flow.



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4 OPERATION

4.A SCOPE

FLOWFAST H horizontal laminar airflow cabinet is manufactured in compliance with the international standards for the protection of the material manipulated in the working chamber.

The cabinets meet ISO 14644-1 Class 5 requirements.

4.B CONTROL and REGULATION SYSTEMS

The FLOWFAST H cabinet is provided with a manual electronic regulation system, or, if installed, with an automatic regulation system, to keep the airflow velocity (0.45 m/sec) constant. This system counters the effects of the gradual clogging of the HEPA filter up to pressure levels of nearly 350 Pa.

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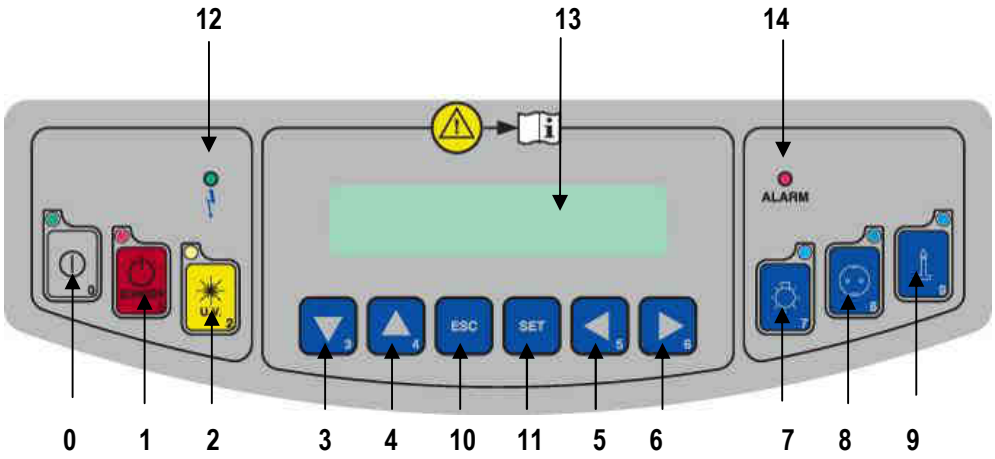
4.C SYMBOLS of CONTROL BOARD

List and description of all the symbols and controls of the control board :



0 MAIN SWITCH:

Position "0" — in the "0" position, the green light of the mains voltage is on [12]; the LCD displays the model name.In this position the operator can activate only the fluorescent light [7], the U.V. lamp [2] and the power outlet [8] (with plug installed) and can activate the data stored in the microprocessor by pressing the “Right Arrows” key [6].

Position "I" — Press key "I" [0], if the PCB for the automatic regulation is installed (OPTIONAL), insert the password using the small numbers in the right lower corner of the keys and press SET. Default password is 5 – 4. When the password is typed in the green led of the switch lights up and the cabinet starts operating, the motor-blower is powered and first "CHECK PANEL" then "STAND-BY" appears on the display till the air flow reaches the pre-set value. In addition, an audible alarm will sound intermittently during this stand-by period, alerting the operator not to start working yet. When the audible alarm stops and the message "STAND-BY" disappears from the display, the cabinet is ready for use. The air velocity is displayed.

NOTE: In any case, it is advisable to wait 5 minutes before starting work.

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1 STAND BY (speed reduction) By pushing the corresponding red key the password (the same to start the ventilation) is requested. Once confirmed the password the function is enabled. When it is enabled, the corresponding red LED lights up and, for single fan cabinets, the air speed is about 30% lower than their nominal speeds. The light and the gas electrovalve cannot be switched on. If they are on, they switch off automatically. If the PCB for the automatic regulation is installed following two messages appear alternatively:

>>>ATTENTION<<<
DANGER

and:

REDUCED AIRFLOW
>>>DO NOT WORK<<<

The "SPEED REDUCTION" function can be enabled only with the main switch in position "I". Only the internal socket [8] can be operated.

2 U.V. (optional) Yellow key to switch on UV. This supplies the U.V. lamp in "manual" mode; when enabled, the display shows "U.V. on". The U.V. lamp switches on only if the cabinet is off, the lighting of the cabinet is off and the front window is completely closed.

By pushing the relevant key you are requested to set the U.V working time. The timer resolution is 1 minute and the maximum time is 180 minutes (3 hours). The display will show the latest pre-set value, which can be changed using the "arrow" keys; when the time has been set, press the "SET" key to confirm. At this point the yellow LED lights up, the U.V. lamp is activated and the countdown starts. During the cycle the following message appears:

U.V. TIMER
U.V. Timer (min) xxxx

3-4 UP/DOWN ARROWS Use the arrow keys to scroll the menu, to program changing parameters and to put in the password. Two passwords are programmed:
1) to start the cabinet and to enter the operator menu
2) to enter the main menu to change the data input (allowed only to authorized technical staff – service – because unsuitable interventions can cause troubles and incorrect operation of the cabinet.

5-6 LEFT/RIGHT ARROWS Use the arrow keys to scroll the menu: if pressed the following data will appear on the display:

U.V. Lamp Residual Lifetime: Shows the operating time of the U.V.lamp pre-set by the user with the appropriate keys. The LCD will display (for example) "U.V. TIME=XXXX h" . When such time is over, the message "U.V. LIFETIME OVER" will appear on the line below.

1, 2, 3 **Residual lifetime of filters** : it is the operation time of the filters installed in the cabinet that can be programmed by the user. The LCD will display (for example)" RES. TIME FILTER 1=XXXX:XX h:min". When such time is over, the message "CHECK FILTER (i.e.) 1". will appear on the line below.

The filters installed in the cabinet follow the numbering listed below

TYPE of FILTER	NUMBER
MAIN HEPA	1
EXHAUST HEPA	2
ACTIVE CARBON	3

LAF Power: it is shown indirectly by the power supply voltage of the motor, expressed as percentage of max. load voltage displayed also in proportion by a bar.

The display shows the notice(es.): "MOT.LAF = XX % " (max.100%).

Operating Time: Shows the operating time of the cabinet from the moment when the main switch is positioned on "I"
The LCD will display (for example) "WORK TIME=XXXXXh". This value cannot be reset.

7 LIGHT This switches on the fluorescent light; when enabled, the display shows "Light on". Switching on the fluorescent light automatically the U.V. lamp switches off.

8 SOCKET This supplies voltage; when enabled, if the PCB for the automatic regulation is installed the display shows "POWER ON". The global current for all the sockets installed on the cabinet is 4 Amps.

9 GAS (optional) This activates the control for opening/closing the gas electrovalve; when enabled, if the PCB for the automatic regulation is installed the display shows "GAS ON". It operates only when the ventilation is running to prevent possible over-heating and risks of damaging the HEPA filter.

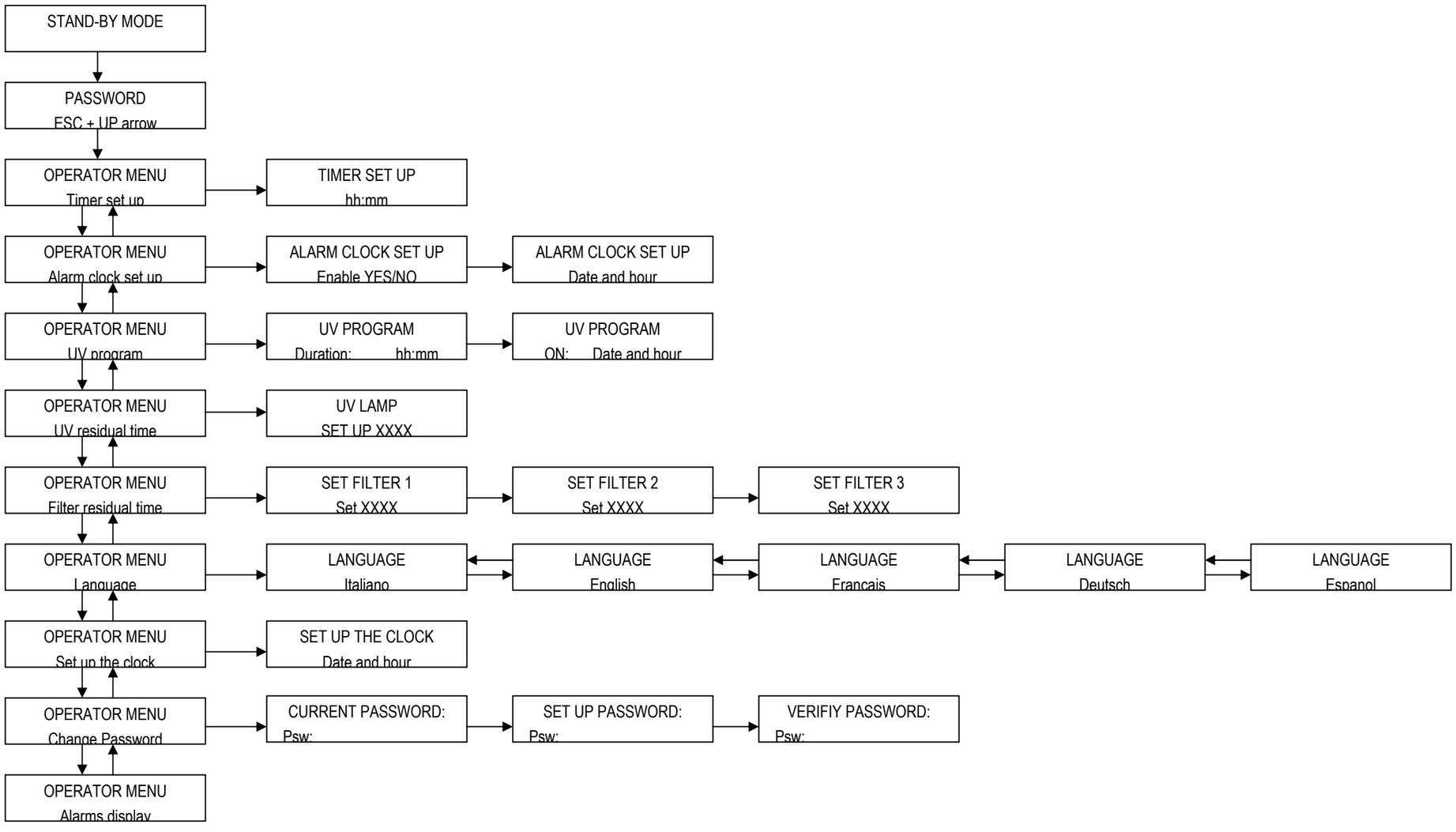
10 ESC ESC key deletes the operation of data input and goes back to the starting condition**.**

When an alarm condition occurs, which is shown also by the message appearing on the LCD. By pushing "ESC" the alarm stops sounding. If the cause of the alarm is not resolved after 2 min the buzzer starts to sound again.

11 SET	SET key lets you enter the different functions or confirm the data input going back to the upper level.
12 LINE	The green mains light switches on if the unit is connected to the mains and the line is live
13 DISPLAY (optional)	Rearlight liquid crystal "LCD" display composed of 2 lines of 20 characters each showing the operating parameters and alarms.
14 ALARM	When an alarm occurs the red LED lights up.

4.D OPERATOR MENU (OPTIONAL)

It's possible enter the operator menu, with the cabinet in stand-by mode and when the cabinet is switched on, by pressing at the same time the keys "ESC" (7) and "ARROW UP" (6).
If enter the operator menu while the cabinet is running, it's possible to set only the "ALARM CLOCK" and the "TIMER".



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U.V. LAMP RESIDUAL LIFETIME:

- use "UP/DOWN arrow" keys [5/6] to choice the desired menu
- select "**U.V. LAMP RESIDUAL LIFETIME**." and press "SET" [10] key; the display will show:

U.V. LAMP RESIDUAL LIFETIME
set XXXX

- where XXXX shows the number of the hours set for lifetime of the U.V. lamp.
- Use the "up and down arrow" keys to adjust the hours parameter
- Then press the "SET" key [8] to confirm the data and/or go back to previous menu
- To conclude programming, press ESC" [7] key.

FILTERS RESIDUAL LIFETIME:

- use "UP/DOWN arrow" keys [5/6] to choice the desired menu
- select "**FILTERS RESIDUAL LIFETIME**." and press "SET" [8] key; the display will show:

FILTER 1 RESIDUAL LIFETIME
set XXXX

where XXXX shows the number of the hours set for lifetime of the FILTER 1

- Use the "up and down arrow" keys to adjust the hours parameter
- Then press the "SET" key [8] to confirm the data and pass to filter 2 and so on up to filter 5 (as for relation between number and type of filter see table par. 4C)
- To conclude programming, press ESC" [7] key.

LANGUAGE SELECTION

- use "UP/DOWN arrow" keys [5/6] to choice the desired menu
- select "LANGUAGE" and press the "SET" key and the following message will be shown on the display:

LANGUAGE
English

- With the "up and down arrow" keys select the desired language (Italian, English, French, German, Spanish).
- Press the "SET" key to confirm and exit the "LANGUAGE" menu.
- press "ESC" [7] keyto go out.

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SET UP THE CLOCK

- use "UP/DOWN arrow" keys [5/6] to choice the desired menu
- select “SET UP THE CLOCK.” and press "SET" [8] key; the display will show:

SET UP THE CLOCK
set XXXX

- Use the “left and right arrow” keys to select the desired parameter and set it using the “up and down arrow” keys
- Then press the "SET" key to confirm the data and/or go back to previous menu
- To conclude programming, press ESC” [7] key.

PASSWORD CHANGE

- use "UP/DOWN arrow" keys [5/6] to choice the desired menu
- select “PASSWORD CHANGE” and press "SET" [8] key; the display will show:

CURRENT
PSW:

- digit the present Password then press “SET” key

SET UP PASSWORD
PSW:

- digit the new Password then press “SET” key

VERIFY PASSWORD
PSW:

- digit the password again and then press “SET” key to confirm the data and/or go back to previous menu
- To conclude programming, press ESC” [7] key.

DISPLAY OF HISTORICAL FILES

- use "UP/DOWN arrow" keys [5/6] to choice the desired menu
- select “ALARMS DISPLAY” and press "SET" [8] key;
- use "UP/DOWN arrow" keys to scroll through the list of the possible troubles happened . The list is in chronological order and contains up to 64 voices
- To conclude programming, press ESC” [7] key.

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ALAEM CLOCK

- use "UP/DOWN arrow" keys [5/6] to choice the desired menu
- select “ALARM CLOCK” and press "SET" [8] key; the display will show:

Alarm clock set up
Set up XXXX

- Use the “left and right arrow” keys to select the desired parameter and set it using the “up and down arrow” keys
- Then press the "SET" key to confirm the data and/or go back to previous menu
- Press “ESC” to abort the procedure
- When the set time is reached the buzzer start to ring and the display show this message

ALARM CLOCK
ALARM

- Press the “ESC” key to silence the acoustic signal

TIMER SETUP

- use "UP/DOWN arrow" keys [5/6] to choice the desired menu
- select “TIMER SETUP” and press "SET" [8] key; the display will show:

Timer set up
Set up XXXX

- Use the “left and right arrow” keys to select the desired parameter and set it using the “up and down arrow” keys
- Then press the "SET" key to confirm the data and/or go back to previous menu
- Press “ESC” to abort the procedure
- At the end of the countdown the buzzer start to ring and the display will show this message:

TIMER
ALARM

- Press the “ESC” key to silence the acoustic signal

UV TIMER

- use "UP/DOWN arrow" keys [5/6] to choice the desired menu
- select “UV TIMER” and press "SET" [8] key; the display will show:

UV TIMER
Duration XXXX

- Use the “left and right arrow” keys to select the desired parameter and set it using the “up and down arrow” keys
- Then press the "SET" key to confirm the data
- The display shows:

UV TIMER
DATE XXXX

- Use the “left and right arrow” keys to select the desired parameter and set it using the “up and down arrow” keys
- Then press the "SET" key to confirm the data and/or go back to previous menu

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4.E DISPOSAL OF WASTES AND CONTAMINATED MATERIALS

DISPOSAL OF ELECTRIC AND ELECTRONIC DEVICES

INFORMATION FOR EUROPEAN UNION USER

This symbol on the device means that when it needs to be disposed, it must be handled separately from urban waste.

At the moment of the disposal, contact the dealer, to receive information about the collect and disposal in accordance with the laws in force in the country.

Appropriate disposal of this product will help to prevent potential negative effects on health and environment and to promotes re-use and / or recycling of materials of the equipment.

The improper disposal of the product by holder involves the application of sanctions in accordance with the regulations in their own country.

INFORMATION FOR USERS OUTSIDE THE EUROPEAN UNION

This symbol is valid only in the European Union If you want to dispose this product, contact your local authorities or dealer and ask for the correct method of disposal.

ATTENTION:	**Before disposal, the cabinet where contaminants have been manipulated, must be sterilized**

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5 LIMITATIONS

PRECAUTIONS FOR THE CORRECT USE OF THE CABINET.

Listed below are the most important guidelines to be followed and the main substances to be avoided to ensure the correct use of the FLOWFAST H cabinet:

- NEVER handle pathogenic materials of any group or biosafety level.
- NEVER USE chlorine-based substances (e.g. sodium hypochlorite) as they are corrosive for the metal structure of the cabinet, and in particular for stainless steel parts.
- DO NOT use ethanol as a sterilizing substance if a heat source is used under the cabinet.
- DO NOT use cosmetic powders, nail polish, hairspray or cosmetics in general during work.
- DO NOT eat, drink or smoke in the work zone.
- AVOID substances that release explosive vapours.

In addition, when working with the cabinet, AVOID:

- the introduction of extraneous material
- quick movements of arms
- upstream contamination of the material, putting the hands or any object between the absolute filter and the sterile material
- working under the cabinet if the airflow has not been activated yet, and a suitable work condition has not been reached yet. After the cabinet is switched on, and if the work requires special sterile conditions, chemical sterilization of the work chamber must be carried out using a cloth soaked in bactericide. Then wait for 20-30 minutes for the bactericide to take effect.

IMPORTANT: The UV radiations emitted by the germicidal UV lamp can cause erythemas and conjunctivitis. Avoid the exposure of skin and eyes to direct radiation.

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6 OPERATING PROCEDURES

6.A PRELIMINARY CHECKS

Before carrying out any type of work, the following conditions should be verified:

- that the cabinet power cable is connected to a 230V-50Hz outlet (if not distinct voltages/frequencies are shown on the label stuck near the power cable)
- that the work area inside the cabinet is free from materials used during the previous session
- that the work chamber has been cleaned/sterilized.

6.B SWITCHING ON the FLOWFAST H CABINET

To switch on the cabinet, proceed as indicated below:

- Switch on the cabinet by pressing the key ON/OFF  (if the PCB for the automatic regulation is installed insert the password: press the button 5  , button 4  and then the button SET )
- Switch on the lighting, by pushing the key 

The cabinet is ready to work. Wait 5 minutes before starting any operation (see chapter 5).

During this period of time, introduce ALL and ONLY the material indispensable for working in the internal working zone of the cabinet.

6.C SWITCHING OFF FLOWFAST H CABINET

At the end of the work session, proceed as follows:

- Remove the material from the internal work chamber
- Clean the work surface and the inside walls of the chamber, as indicated in the “Cleaning instructions” (chapter 7A)
- Turn off the light by pushing the key 
- Turn off the cabinet by pressing the "ON/OFF” key  (if the PCB for the automatic regulation is installed insert the password: press the button 5  , button 4  and then the button SET )) or press the "SPEED REDUCTION" key 

In case UV lamp is installed in the cabinet, switch on the germicidal lamp by pushing the “U.V.” yellow button  .
The U.V. lamp will switch on only if the front protective shutter is completely down.

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7 MAINTENANCE

7.A INSTRUCTION FOR DAILY CLEANING OF HORIZONTAL LAMINAR FLOW CABINETS (by users)

To clean the outside of the FLOWFAST H cabinet, made of varnished iron-carbon sheet steel, use a damp cloth soaked in soapy water or some other commonly available products for varnished metal surfaces.

To clean the outside of special FLOWFAST H cabinets made of stainless steel AISI 304/316, use a damp cloth soaked in alcohol or soapy water or some other commonly available product for stainless steel sheets.

Clean-sterilize the internal work surface with an efficacious detergent and a bactericide (e.g. ethanol, phenolic compositions, aldehydes, quaternary ammonium salts, etc.).

IMPORTANT: Never use solutions containing free chlorine (for instance, sodium hypochlorite), which cause corrosion to steel and stainless steel, resulting in irreparable damage to the cabinet structure.

IMPORTANT: Before carrying out the following operations of replacement, disconnect the cabinet from the power supply

7.B PREFILTERS CLEANING (by users).

[See chapter 13 – diagram for maintenance operations].

Remove the pre-filter/s [10] from their case and clean them with compressed air, soapy water or water with detergent every month.

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7.C REPLACEMENT OF HEPA FILTER (by technical assistance personnel)

IMPORTANT: For the safety of the personnel and the environment, the use of PVC gloves is recommended as well as the collection of the replaced HEPA filters in polyethylene bags.

[See chapter 13 – diagram for maintenance operations].

1. Unscrew the screws [11] and remove the panel [12]
2. Unscrew the nuts [13] and remove the filter clamps
3. Remove the HEPA filter [14]; with the gasket deformation the filter could be lightly sticky to the structure in some points. In this case exert uniform pressure avoiding, if possible, the use of tools between the HEPA filter and the frame.
4. For re-assembly reverse the above instructions, taking care :
   a) Don't tighten nuts [13] too much
   b) To centre the filter in its housing.

N.B : The new gasket is already stuck on the new filter.

IMPORTANT: After replacing the filter, proceed to the calibration of the motor-fan velocity, and perform also a check with a "light scattering" meter.

7.D REPLACEMENT OF MOTOR-FAN (by technical assistance personnel)

[See chapter 13 – diagram for maintenance operations].

1. Switch the cabinet off and disconnect it from the power supply.
2. Remove the pre-filter/s [10] from the case [1].
3. Disconnect the feeding cables of the motor-fan.
4. Disconnect the feeding cables of the anemometer (if installed).
5. Unscrew the screws [8] and remove the motor-fan [9].
6. For re-assembly reverse the above instructions.

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7.E REPLACEMENT OF FLUORESCENT LAMPS (by user).

[See chapter 13 – diagram for maintenance operations].

1. Switch the cabinet off and disconnect it from the power supply.
2. Remove the prefilter/s [10].
3. Unscrew the nuts [16] and remove the lampholder [15].
4. Replace the lamp [17] and the starter.
5. For reassembly reverse the above instructions.
6. Re-connect the cabinet .

7.F REPLACEMENT OF U.V. GERMICIDAL LAMP (optional - by user).

[See chapter 13 – diagram for maintenance operations].

1. Switch the cabinet off and disconnect UV electric connection.
2. Replace the UV lamp [18] from the inside of the work chamber, taking care not to touch the UV tube with the hands.
3. Replace the starter
4. Reconnect UV electric connection.

IMPORTANT: During the installation of the new lamp, pay attention not to leave fingerprints on the lamp.

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7.G LIST OF SPARE PARTS

CODE	DESCRIPTION	FLOWFAST H			
		09	12	15	18
V50000000100	DDM 7/9 motorfan, 300 W – IP55	1	1	2	2
V50000100450	HEPA filter 915x762x69 mm (36"x30"x2,5")	1			
V50000100460	HEPA filter 1220x762x69 mm (48"x30"x2,5")		1		
V50000100470	HEPA filter 1524x762x69 mm (60"x30"x2,5")			1	
V50000100480	HEPA filter 1830x762x69 mm (72"x30"x2,5")				1
P75007507500	Pre-filter - 855x385x22 mm.	1		1	2
P75007506400	Pre-filter - 535x385x22 mm.		2	1	
V40000027000	Side safety glass	2	2	2	2
V30000008000	PCB PW LAF	1	1	1	1
V30000005200	LAF touch sensitive keyboard	1	1	1	1
V20000006020	18 W / 84 fluorescent lamp	2			
V20000006030	30 W / 84 fluorescent lamp		2		
V20000006040	36 W / 84 fluorescent lamp			2	2
V20000006330	2x18W lamp holder	1			
V20000006350	2x30W lamp holder		1		
V20000006360	2x36W lamp holder			1	1
V20000006900	FN 2070-10-06 line filter	1	1	1	1
	ACCESSORIES				
V30000008100	PCB CPU LAF (automatic regulation)	1	1	1	1
V30000008200	Flat cable PWLAF	1	1	1	1
V30000000090	Proximity switch NAMUR AEG 8/2	1	1	1	1
V50000000910	LAF sensor fan diam. 200 mm	1	1		
V50000000900	LAF sensor fan diam. 154 mm			1	1
V20000006060	20 W U.V. lamp	1	1	1	1
V20000006100	Universal starter S10 13-80 W	1	1	1	1
V20000006120	20 W / 230V UV ballast	1	1	1	1

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8 TROUBLESHOOTING PROBABLE CAUSES OF MALFUNCTIONS

PROBLEM	CAUSE	REMEDY
Cabinet does not work	– the electricity supply has been cut off at the mains – Electronic board out of order – Blown fuse(s)	– check the voltage input to the cabinet – Replace PCB – Replace fuses
Alarm: “HEPA filters check”	Main HEPA filter clogged	Replace HEPA filter
“minimum LAF alarm”. **[Possible contamination of the product but protection of the environment]**	HEPA filters clogged .	Replace HEPA filters.
	The main motor-fan does not work	Check the terminal voltage of the power card of the main motor-fan Check F7 fuse on the power card Replace the power card Replace the microprocessor card
“Black-out ” Alarm **(probable exchange of air between the work chamber and the outside and possible contamination of the environment)**	Blackout	Check the feeding cable, the connection plug/socket, the power supply line Press “ESC” [7] key to silence the alarm
Alarm “Sensors failure”	Failure of sensor XX	Replace XX sensor.
Alarm: “No encoder input LAF”	No signal from LAF flow sensor	Replace the LAF sensor

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9 TECHNICAL SPECIFICATIONS

Housing	carbon steel varnished with epoxy powder by electro- spraying. of AISI 304 glazed stainless steel sheet (on request).
Working surface	AISI 304 glazed stainless steel sheet or plastic laminate (on request)
Pre-filter	Polyurethane filter washable in water or cleanable with compressed air. 75 % Minimum efficiency, dust weight arrestance (ASHRAE); dust holding capacity 400 g/m^2
Absolute filter	HEPA filter, H14; efficiency 99.995% MPPS (H14 according to EN1822)
Motor-fan	of direct coupled centrifugal type. Designed to keep the velocity of air flow (0.45m/s) constant even in the presence of progressive HEPA filter clogging.
Speed regulation	either electronic by manual regulation of the air speed, or automatic if in the version with automatic regulator and digital anemometer. OPTIONAL: automatic regulation with digital anemometer to keep the velocity of air-flow (0.45 m/sec) constant even in the presence of progressive HEPA filter clogging, up to pressure levels near to 360 Pa
Side panels	of safety glass
Lighting	fluorescent tubes
Control panel	touch sensitive keyboard on the front panel
Power supply	230V - 50 Hz single phase
Electrical system	according to EN 61010-1
Testing	electronic “light scattering” meter, fan anemometer, noise meter, luxmeter, and smoke test at the manufacturer’s factory
Electric connection	if required by local legislation, install prior to the power inlet an automatic overload switch equipped with a differential relay with a cut-off threshold no greater than 30 mA.
Earth connection	connect the cabinet to the earth via a suitable protection conductor

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10 ASSEMBLING AND DISASSEMBLING INSTRUCTIONS

The Horizontal Laminar Flow FLOWFAST H cabinet is delivered not fully assembled, since the depth is greater than the standard length of the doors, thus impossible to be introduced into the laboratories where the cabinet is to be installed.

The FLOWFAST H cabinet is supplied in three parts, packed in the following sections:

1. main unit
2. work surface
3. safety glass side panels

For an easy assembly of FLOWFAST H cabinets proceed as follows (see chapters 16 and 17):

1. Lay the main unit [1] on the support table (if supplied - optional) previously assembled following the instructions of chapter 16. -"Assembly diagram of support table".
2. Place the work surface [2] on the main unit [1] in the lower part, checking that the holes of the main unit and of the work surface fit together. Fasten them with the relevant screws and washers [3].

OPTIONAL: UV lamp has to be installed in the cabinet, proceed as follows (see chapter 19 “Assembly diagram of UV lamp”) :

- Put the slide guides of the curtain [22] in the housing of the stirrups for both sides.
- Position and fix the gaskets [4B] on the whole perimeter of the glasses [4]. In this case do not consider the following point 3. but go on from point 4.

3. Place and fix the gasket [4B] on the three lateral support sides of the safety glass
4. Position the upper and lower glass fastener frame [6] and screw the fitting screws hand tight [5]
5. Place the side panels [4] and fasten the screws.-

If the FLOWFAST H cabinet is to be moved or transported into another room please disassemble it reversing the above instructions

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11 TRANSPORT, PACKING and STORAGE INSTRUCTIONS

IMPORTANT: Disconnect power and sterilize the bench before doing any of following operations.

The following instructions will be essential if the end user needs to transport, pack or store a cabinet after a period of routine use (e.g. laboratory/plant relocation):

- Disconnect tubes for gas/vacuum
- If the cabinet is to be moved from one laboratory to another within the same building:
  - on a table with wheels: it is sufficient to put the cabinet on the table; do not place it on one side or on the back panel.
  - by a forklift: put the cabinet on a pallet to ensure good stability and to protect the basin under the cabinet against damage in transport.

It is important to check if the assembled cabinet can get through the doorway, elevator or anything else without any problem. In case the cabinet overall dimensions are greater than doorways or anything else (which usually happens), is necessary to dismantle the cabinet in three sections:

[1] main unit

[2] work surface

[4] safety glass side panels

[21, 22, 23] shutter, slide guide and stirrup for shutter hooking

For disassembling operations please refer to chapter 10 - "Assembling and Disassembling Instructions"

Take care not to damage protruding parts (e.g.: key switch, gas/vacuum taps, exhaust duct when passing through doors/windows

If the cabinet is kept temporarily unused at final destination, cover the cabinet with a protective film (bubble cover) taking care to protect also the exhaust duct, especially from dust.

We recommend extreme caution in long-distance moving carried out by forwarding agents (e.g. change of address): we suggest that you use the original packaging supplied by the manufacturer with the cabinet. Packaging characteristics:

Wooden pallets of the following dimensions:
FLOWFAST H 09 : 111 x 83,5 x 12 cm
FLOWFAST H 12 : 142,5 x 87,5 x 12 cm
FLOWFAST H 15 : 204 x 83 x 12 cm
FLOWFAST H 18 : 204 x 83 x 12 cm

Cardboard base to be laid on the pallet of the following dimensions:
FLOWFAST H 09: 79,5 x 108 x 1 cm (thick)
FLOWFAST H 12 : 138,5 x 83,5 x 1 cm (thick)
FLOWFAST H 15 : 79,5 x 199,5 x 1 cm (thick)
FLOWFAST H 18: 79,5 x 199,5 x 1 cm (thick)

Bubble cover to wrap and protect the cabinet from dust

Cardboard package of the following dimension:
FLOWFAST H 09: 109,5 x 82,5 x 149 cm (1 cm. thick)
FLOWFAST H 12 : 140 x 85 x 145,5 cm (1 cm. thick)
FLOWFAST H 15 : 202,5 x 82 x 147 cm (1 cm. thick)
FLOWFAST H 18: 202,5 x 82 x 147 cm (1 cm. thick)

Steel strap and clips.

During transport pay attention to maintain the package in vertical position (i.e. the pallet at the bottom).

The cabinet (with or without the package) must be kept in a place with the following environmental conditions :

- Min. temperature: 0 °C
- Max. temperature: 70 °C
- Max. humidity: 90 %

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12 ADDITIONAL INFORMATION

12.A GUARANTEE

The guarantee for FLOWFAST H horizontal laminar air-flow cabinets is 12 months from date of invoice.

In addition to those cases specifically indicated in Chapter 5 relating to improper use of the cabinet, the guarantee offered by Faster S.r.l. also excludes certain improper uses described in the instruction manual, of which the most important are listed again below :

- installation in a place which does not conform to the manufacturer's recommendations
- wrong power voltage
- poor earthing
- use of chlorine or its derivatives, incompatible with stainless steel, for cleaning the cabinet
- tampering or changes made by the client
- tampering with the cabinet using any type of tool
- improper connection between the electrical outlet and the power cable
- wrong connection between the gas cock or electro-valve and gas mains

12.B ADDRESS OF TECHNICAL ASSISTANCE (by distributor)

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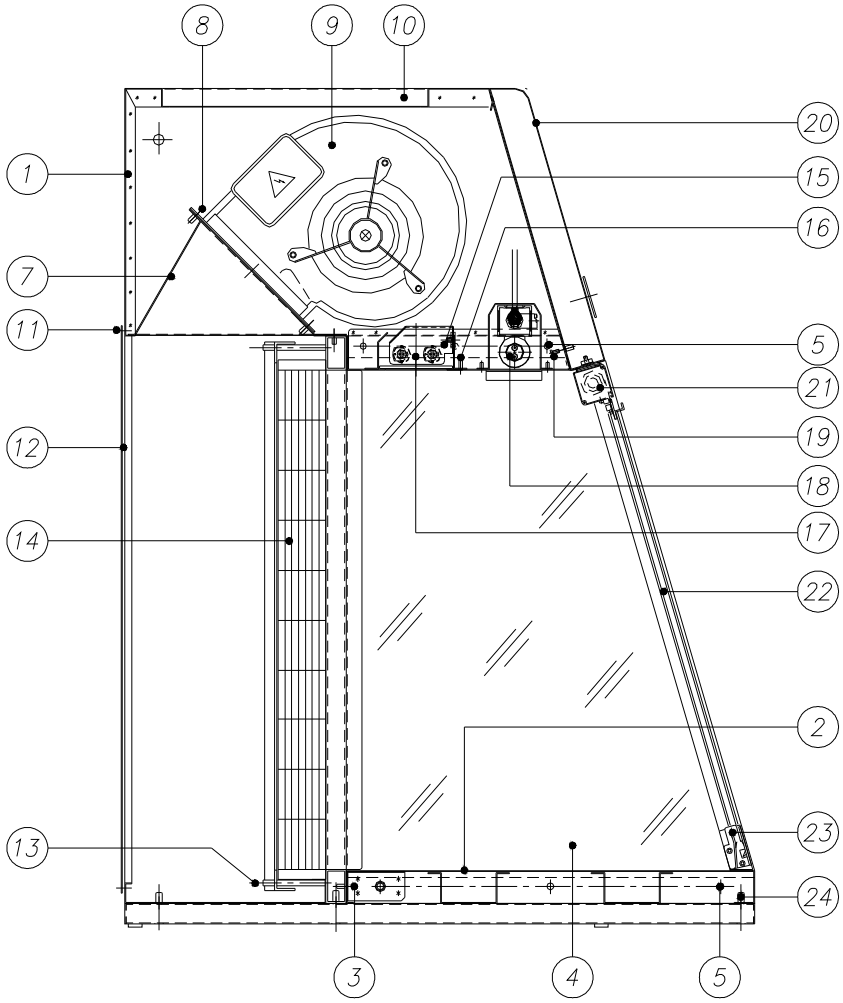
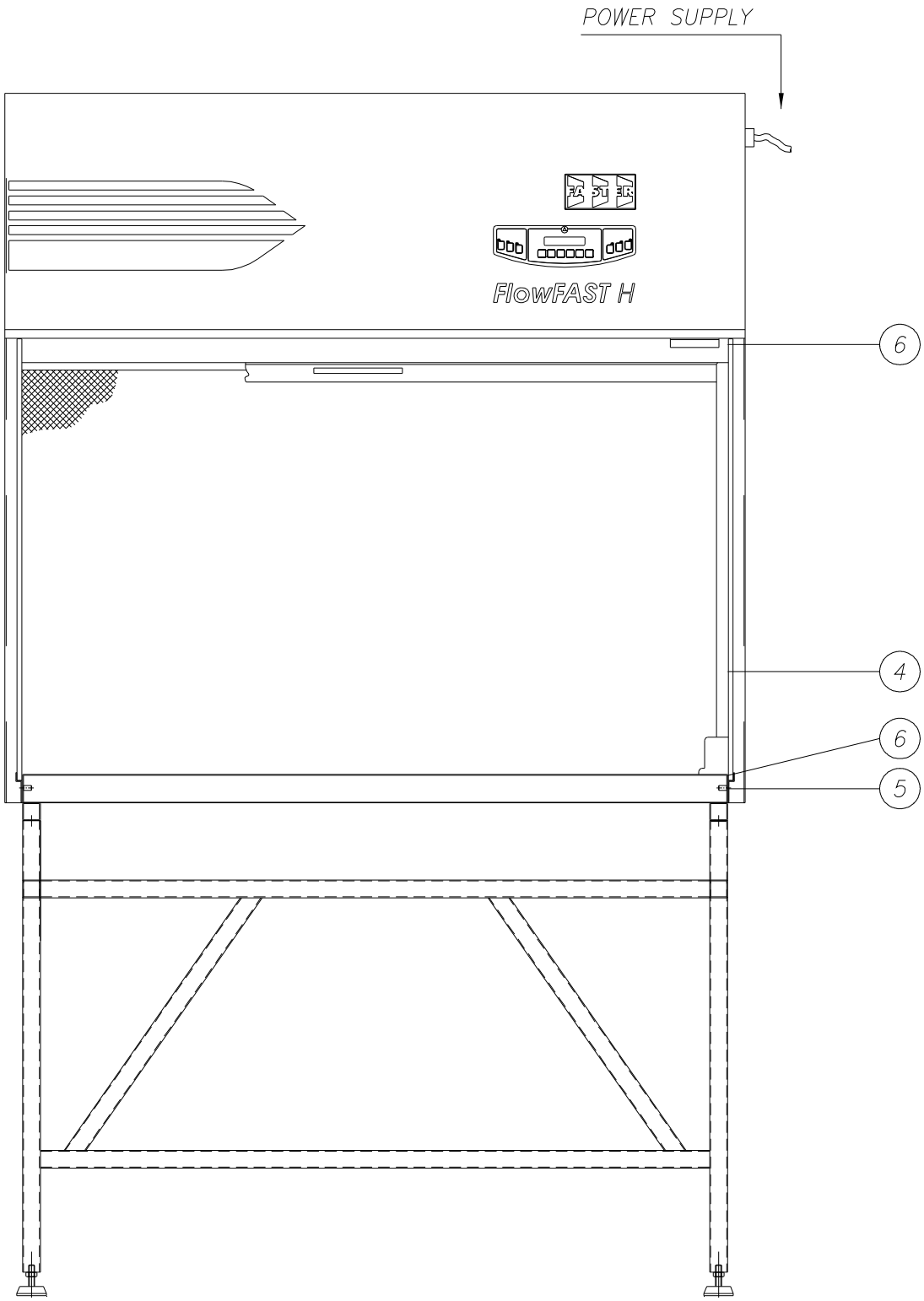
13 GUIDE-DIAGRAM FOR MAINTENANCE OPERATIONS

LEGENDA	
1	Case
2	Work surface
3	Screws
4	Glass
5	Screws
6	Fastener frame
7	Junction
8	Motorblower screws
9	Motorblower
10	Pre-filter
11	Screws
12	Rear panel
13	Nuts
14	HEPA filter
15	Lamp holder
16	Nuts
17	Lamps
18	UV lamp
19	Screws
20	Front panel
21	Shutter
22	Slide guides
23	Stirrup for shutter hooking
24	Screws


8
9
10
20
1
15
16
7
11
5
21
19
12
18
14
17
22
2
23
13
24
3
4
5


POWER SUPPLY
FlowFAST H
6
4
6
5

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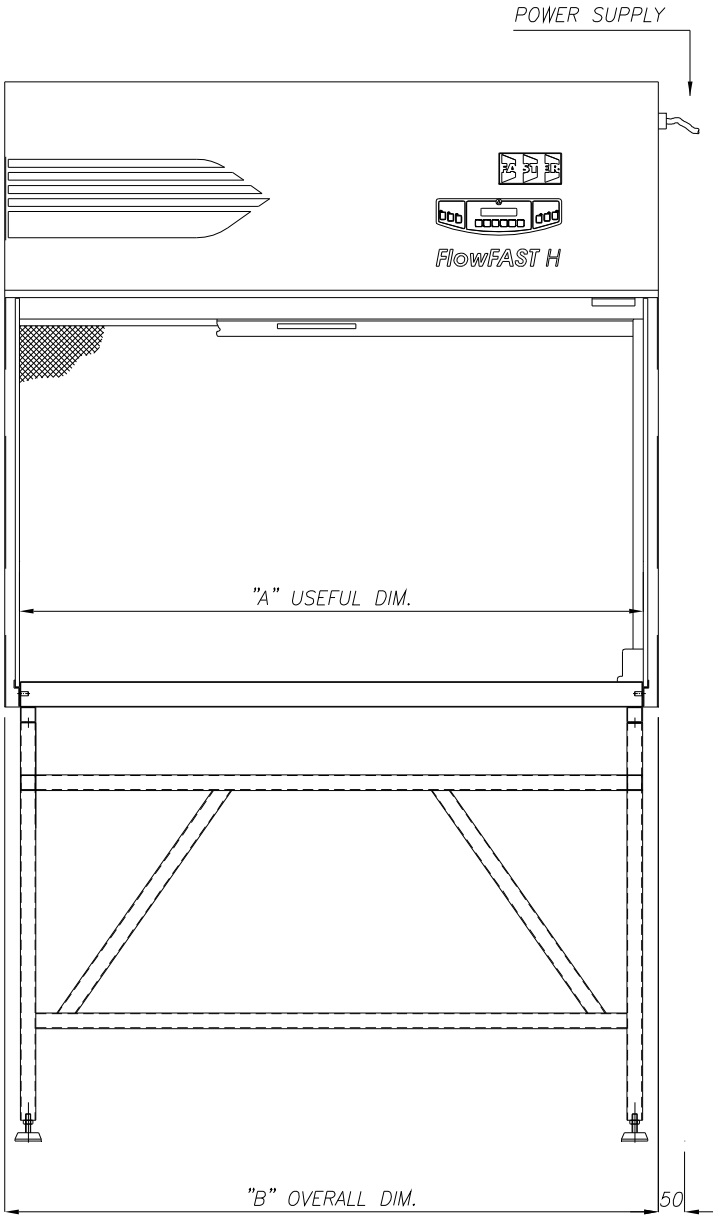
14 FLOWFAST H FRONT and SIDE DIAGRAMS

14.A FRONT DIAGRAM



	A	B
FlowFAST H 09	885	945
FlowFAST H 12	1190	1250
FlowFAST H 15	1495	1555
FlowFAST H 18	1800	1860

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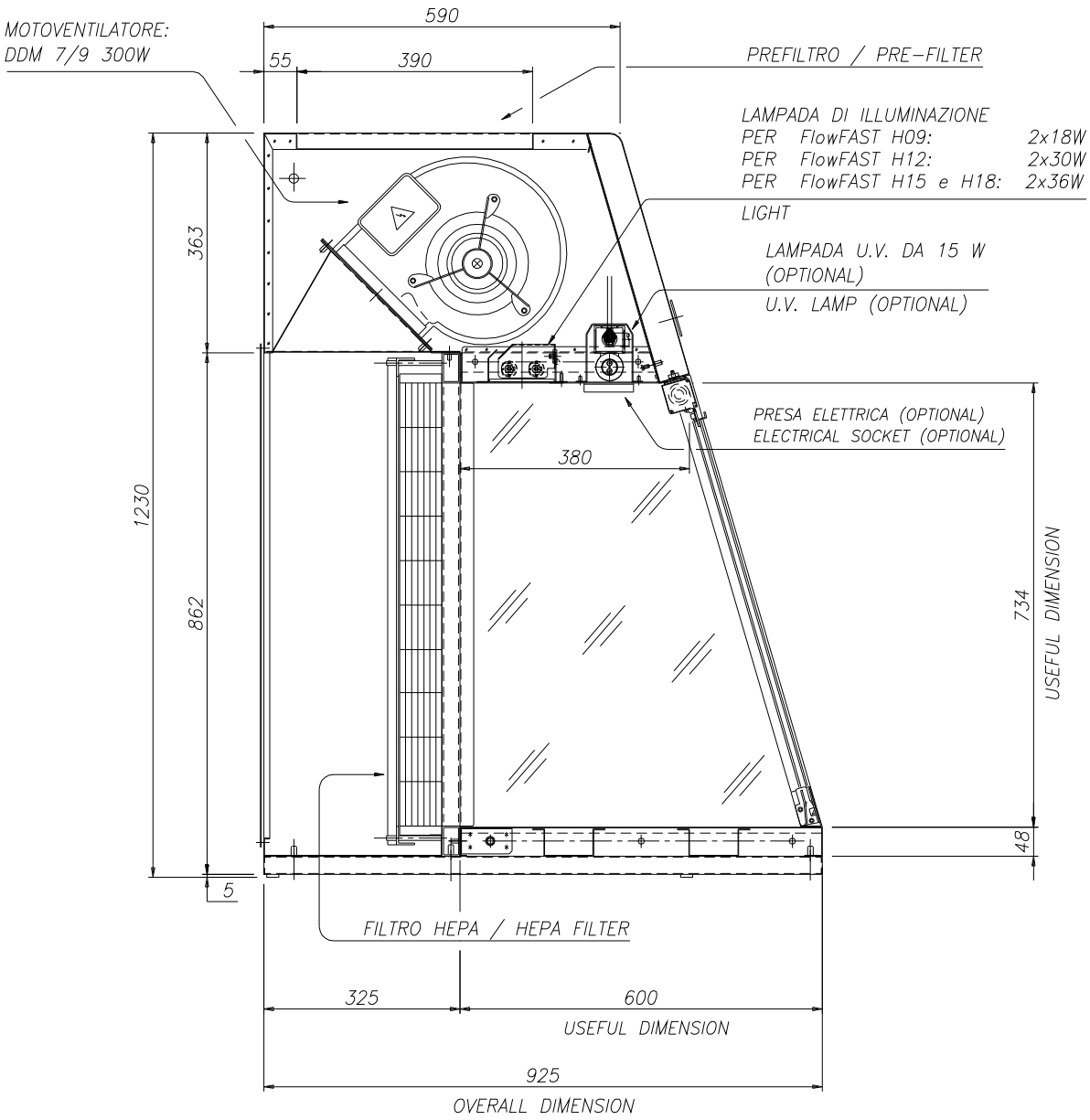
14.B SIDE DIAGRAM



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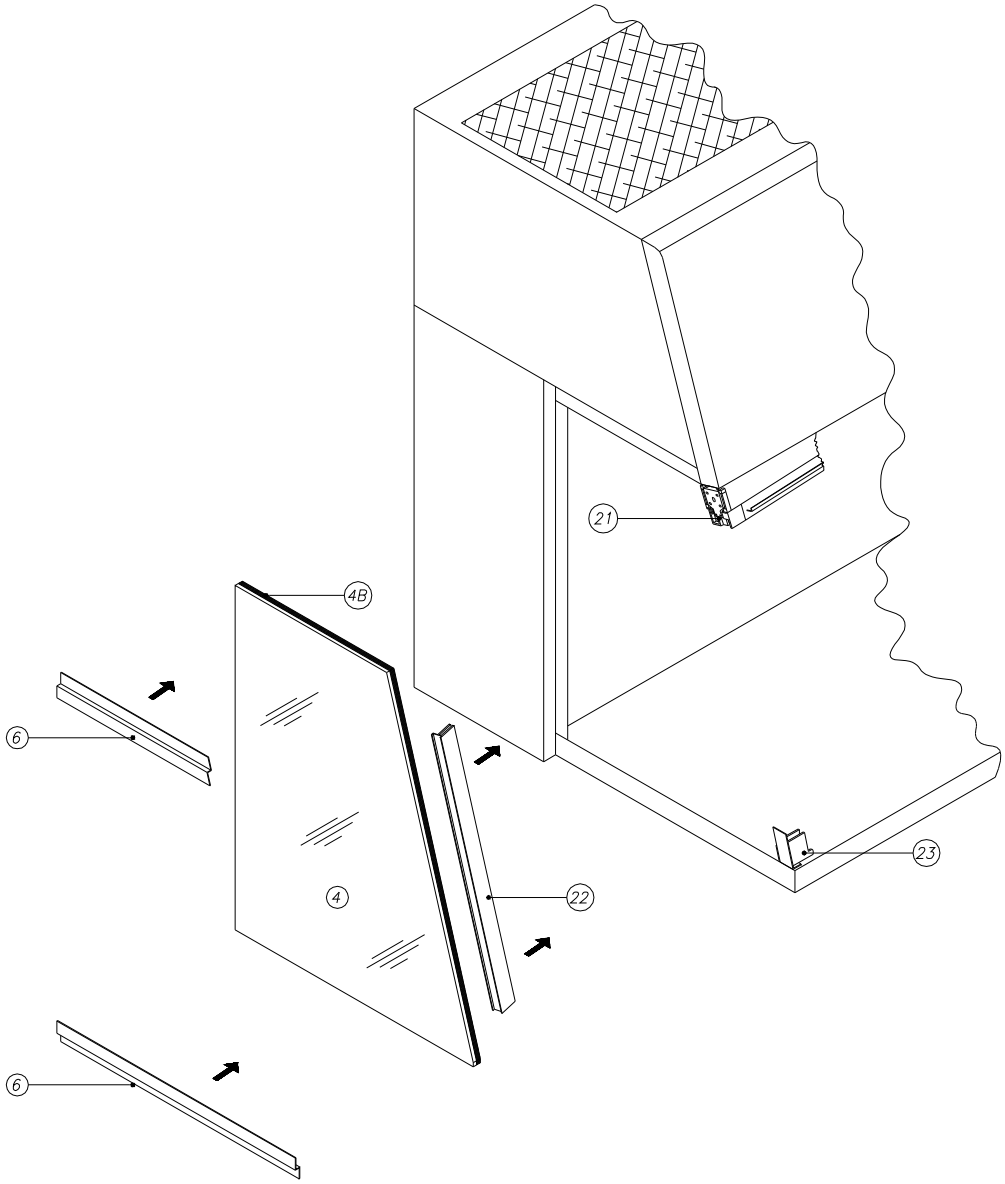
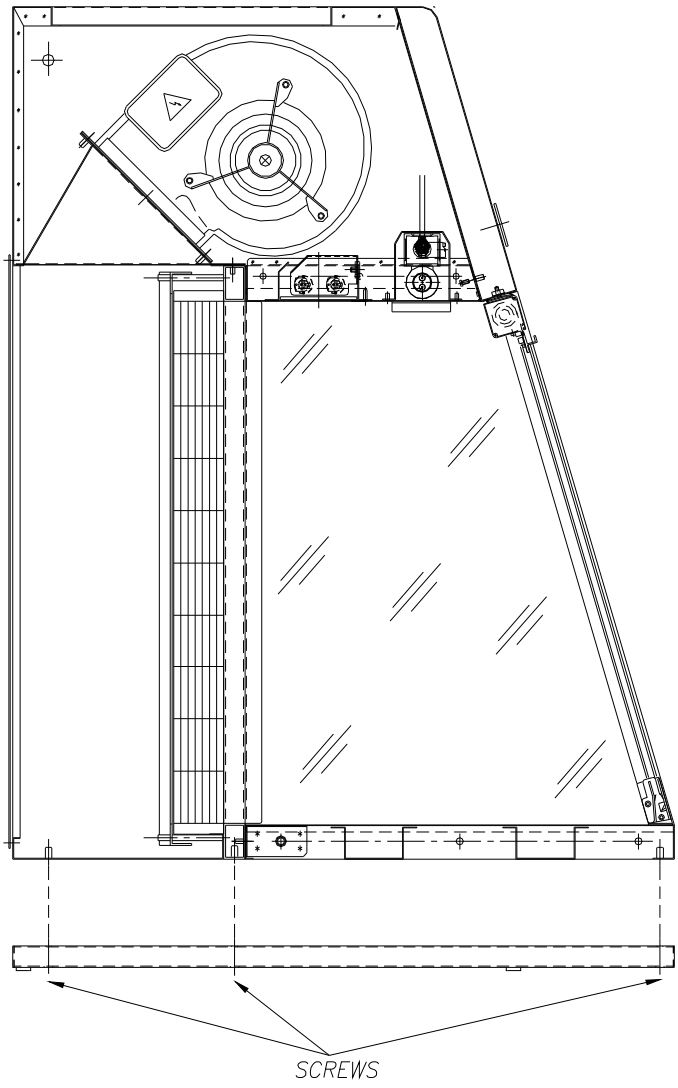
15 CABINET MOUNTING




SCREWS

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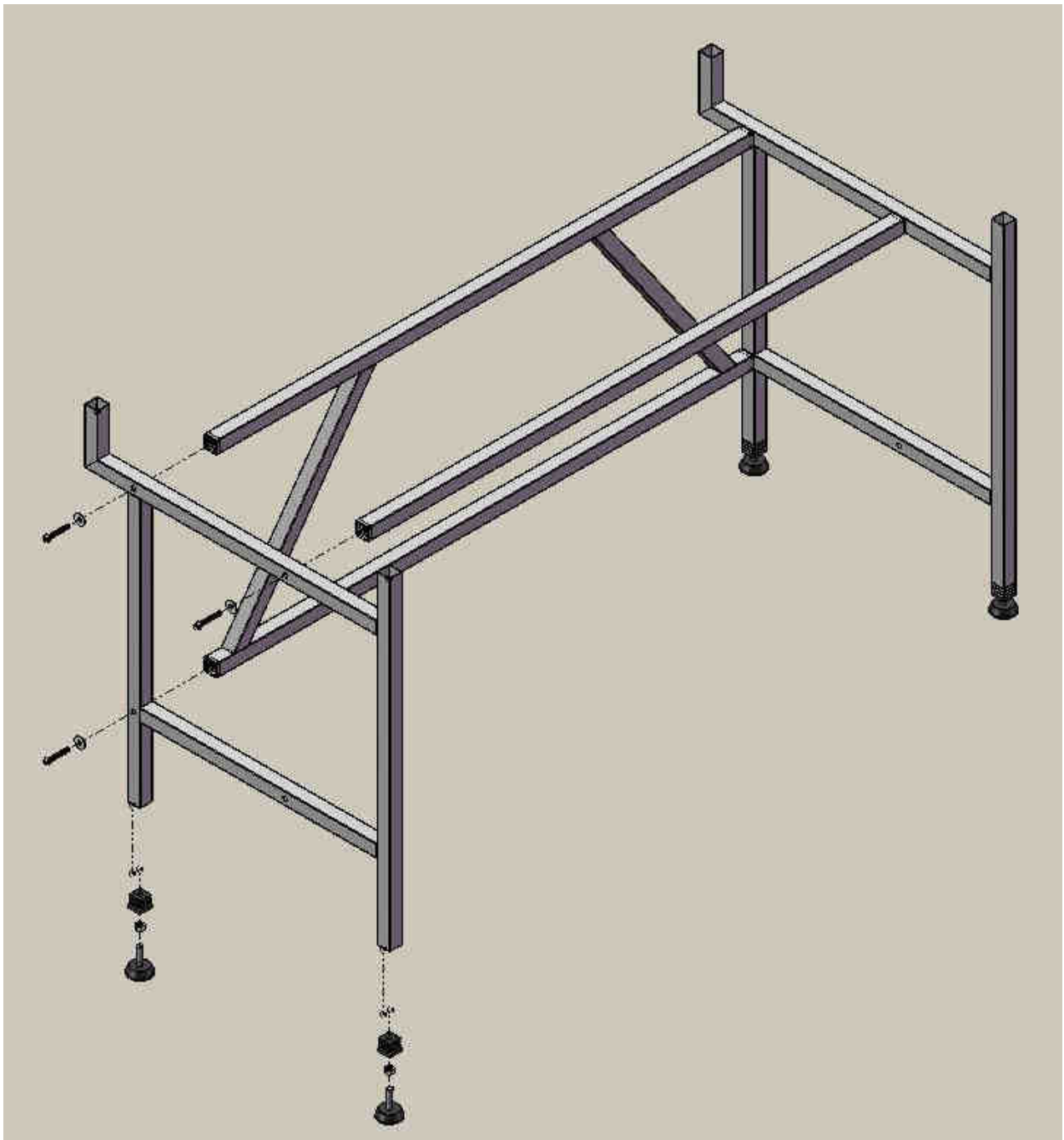
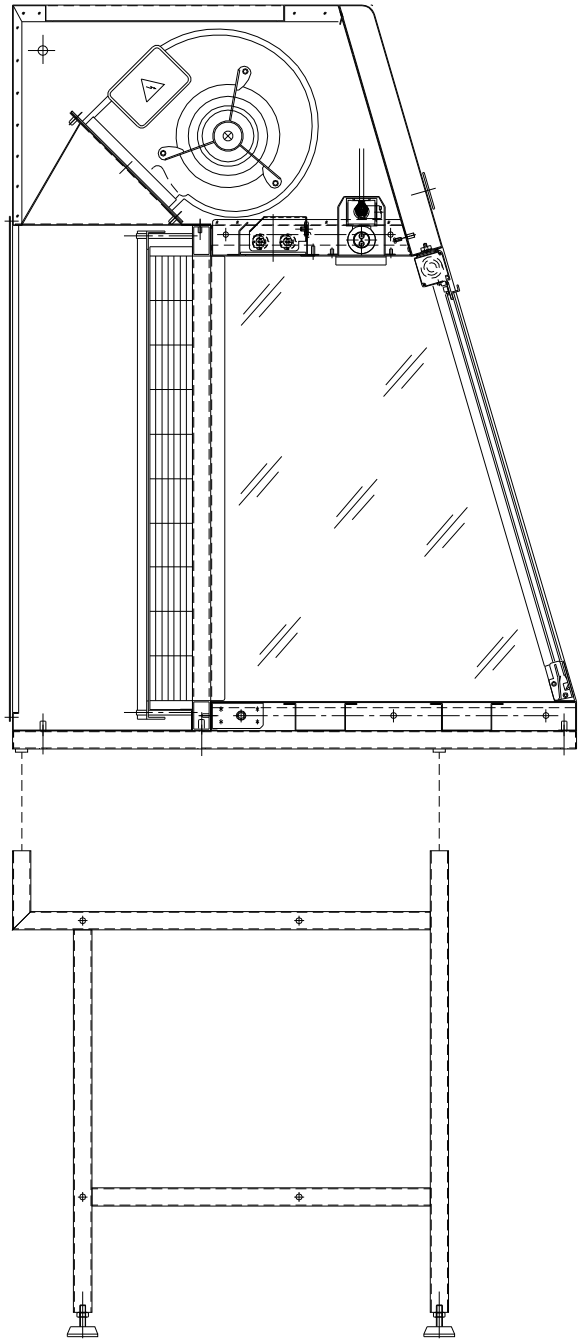
16 ASSEMBLY of SUPPORT TABLE



17 ASSEMBLY OF THE CABINET ON THE TABLE (optional)



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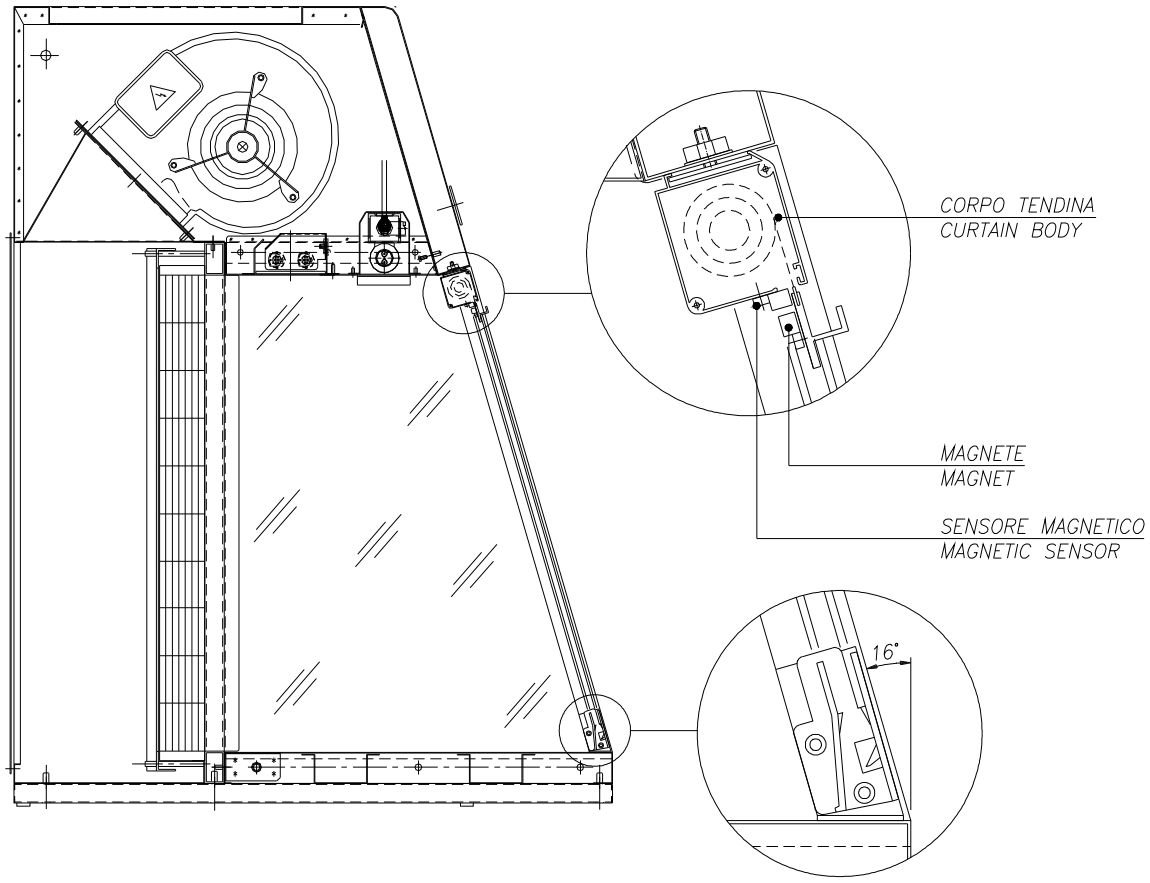
18 SIDE DIAGRAM WITH U.V. LAMP (optional)



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19 SENSORS LIST

PLUG	Software name	Description
J4-CPULAF	S0	Air flow sensor
J3- CPULAF	S1	
J2- CPULAF	S2	
J3-PWLAF	S3	Magnetic sensor for U.V.
J2- PWLAF	S4	Proximity switch for U.V.

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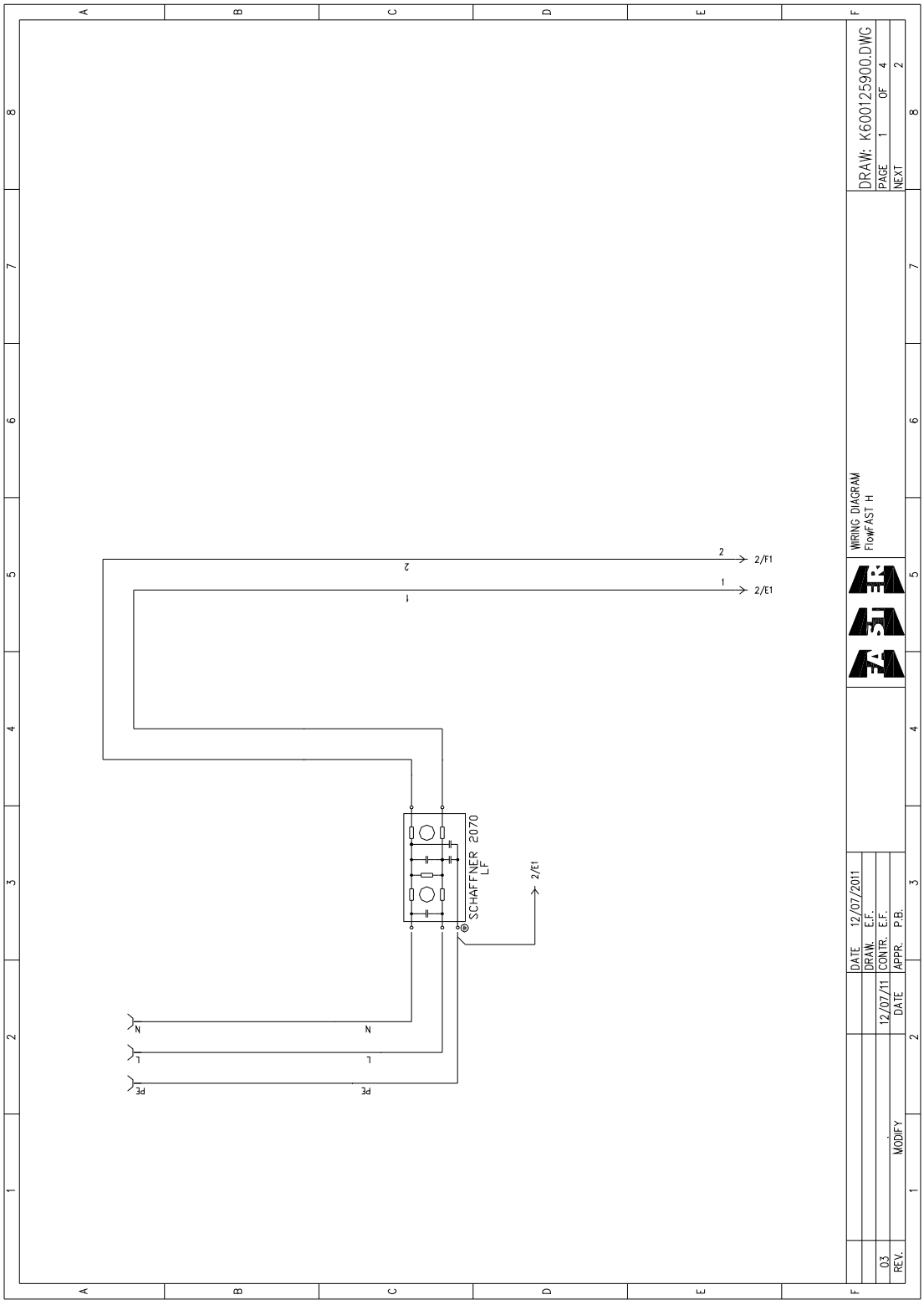
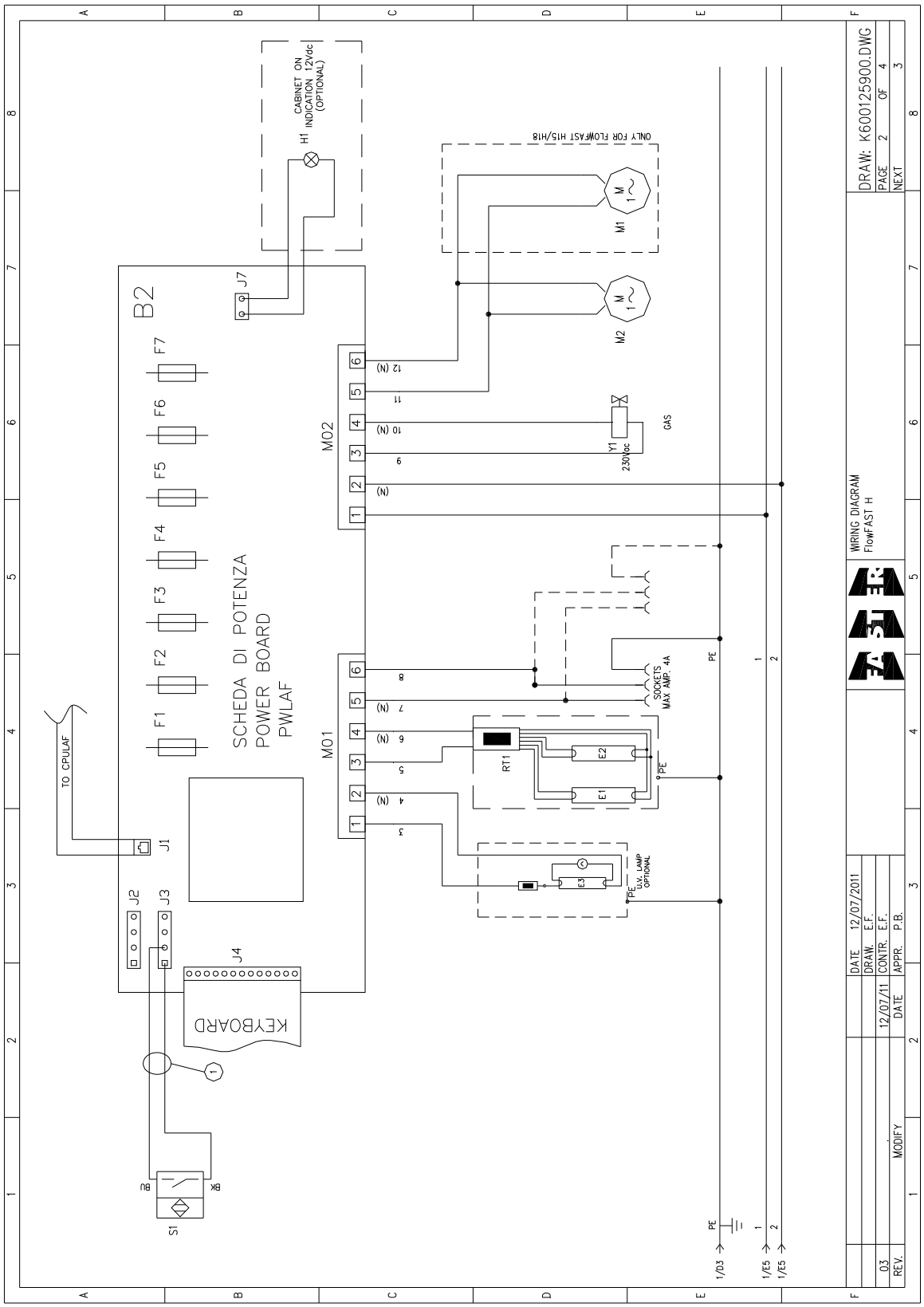
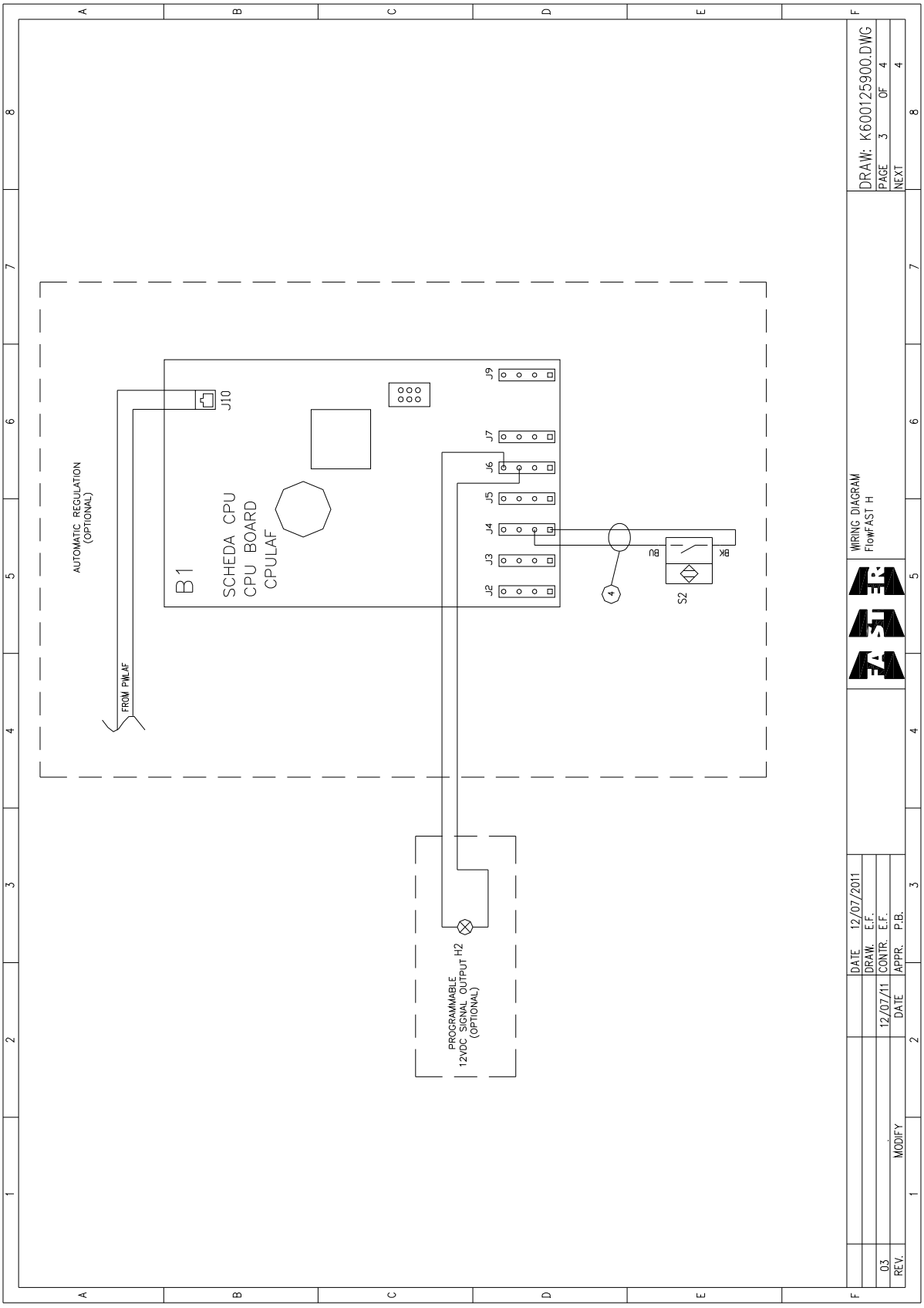
20 WIRING DIAGRAM




CABINET ON INDICATION 12Vdc (OPTIONAL)
H1
ONLY FOR FLOWFAST H15/H18
M1
M2
B2
J7
F7
F6
F5
F4
F3
F2
F1
SCHEDA DI POTENZA
POWER BOARD
PWLAF
MO2
MO1
Y1
230Vac
GAS
TO CPU.AF
J1
J2
J3
J4
KEYBOARD
S1
RT1
E1
E2
E3
SOCKETS MAX AMP. 4A
U.V. LAMP OPTIONAL
PE
1/D3
1/E5
1/E5
DRAW: K600125900.DWG
PAGE 2 OF 4
NEXT 3
WIRING DIAGRAM
FlowFAST H
DATE 12/07/2011
DRAW. E.F.
CONTR. E.F.
APPR. P.B.
12/07/11 MODIFY
03 REV.


AUTOMATIC REGULATION
(OPTIONAL)
FROM PWLAF
J10
B1
SCHEDA CPU
CPU BOARD
CPULAF
J9
J7
J6
J5
J4
J3
J2
BU
BK
S2
4
PROGRAMMABLE
12VDC SIGNAL OUTPUT H2
(OPTIONAL)
DRAW: K600125900.DWG
PAGE 3 OF 4
NEXT
WIRING DIAGRAM
FlowFAST H
DATE 12/07/2011
DRAW. E.F.
CONTR. E.F.
APPR. P.B.
12/07/11
DATE
MODIFY
03
REV.

INITIALS	DESCRIPTION	QUANTITY	FlowFAST H09	FlowFAST H12	FlowFAST H15	FlowFAST H18	NOTE
S1	WINDOW CLOSURE MAGNET SENSOR	1					
S2	LAF MOTOR PROXIMITY	1	AEG 8/2	AEG 8/2	AEG 8/2	AEG 8/2	
F1	FEEDER FUSE	1	0,16 AT	0,16 AT	0,16 AT	0,16 AT	DIM. 5 X 20
F2	U.V. LIGHT FUSE	1	1 A	1 A	1 A	1 A	DIM. 5 X 20
F3	LIGHT FUSE	1	2 A	2 A	2 A	2 A	DIM. 5 X 20
F4	SOCKET FUSE – NEUTRAL	1	4 A	4 A	4 A	4 A	DIM. 5 X 20
F5	SOCKET FUSE – PHASE	1	4 A	4 A	4 A	4 A	DIM. 5 X 20
F6	ELECTRIC VALVE FUSE	1	1.6 A	1.6 A	1.6 A	1.6 A	DIM. 5 X 20
F7	LAF MOTOR FUSE	1	6.3 AT	6.3 AT	6,3 AT	6,3 AT	DIM. 5 X 20
E1	NEON TUBE	1	18 W	30 W	36 W	36 W	
E2	NEON TUBE	1	18 W	30 W	36 W	36 W	
E3	U.V. TUBE	1	20 W	20 W	20 W	20 W	
M1	LAF MOTOR	1	DDM 7/9 300 W	DDM 7/9 300 W	DDM 7/9 300 W	DDM 7/9 300 W	
M2	LAF MOTOR	1			DDM 7/9 300 W	DDM 7/9 300 W	
PP	SOCKET	1	I.P. 44	I.P. 44	I.P. 44	I.P. 44	
EV	ELECTRIC VALVE	1	230 V c.a.	230 V c.a.	230 V c.a.	230 V c.a.	
B1	CPU BOARD	1	CPULAF	CPULAF	CPULAF	CPULAF	
B2	POWER BOARD	1	PWLAF	PWLAF	PWLAF	PWLAF	
LF	LINE FILTER	1	FN2070A-10-06	FN2070A-10-06	FN2070A-10-06	FN2070A-10-06	

			DATE 12/07/2011	
			DRAW. E.F.	
03	.	12/07/11	CONTR. E.F.	
REV.	MODIFY	DATE	APPR. P.B.	

WIRING DIAGRAM
FlowFAST H

DRAW: K600125900.DWG
PAGE 4 OF 4
NEXT

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21 DECLARATION OF CONFORMITY

CE

The undersigned legal representative of the company Faster S.r.l. hereby declares that the follow products:

FlowFAST H

are in compliance with the following directives:

2006/42/EC Directive of the European Parliament and of the Council on machinery

2004/108/EC Directive of the European Parliament and of the Council on the approximation of the laws of the Member States relating to electromagnetic compatibility

2006/95/EC Directive of the European Parliament and of the Council on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits

and with the following standards:

ISO 14644-1 Cleanrooms and associated controlled environments: Part 1: Classification of air cleanliness.

EN 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: general requirements

EN 61326-1 Electrical equipment for measurement, control and laboratory use EMC requirements

and, according to the above-mentioned directives, the CE IIA mark has been applied.

The undersigned also declares that the person who is authorised to compile the relevant technical documentation is Mr.:

Ing. Pietro Bascapè

Faster S.r.l.
Maria Giulia Turzi
Chairman of the board