Fume Hood Controller

Installation, Operation and Maintenance Manual

June 2025

1 General Information

1.1 Introduction

DO NOT INSTALL, USE OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL HAS BEEN FULLY READ AND UNDERSTOOD. RETAIN THESE INSTRUCTIONS FOR FUTURE USE.

THESE INSTRUCTIONS ARE INTENDED TO SUPPLEMENT GOOD GENERAL PRACTICES FOR THE VARIOUS STYLES OF PLASTEC FANS AND BLOWERS. DETAILED INSTRUCTIONS WILL BE PRESENTED SEPARATELY.

IT IS THE RESPONSIBILITY OF THE USER / PURCHASER TO ASSURE THE INSTALLATION, OPERATION, AND MAINTENANCE OF THIS EQUIPMENT IS CARRIED OUT BY EXPERIENCED AND QUALIFIED PERSONNEL IN THIS TYPE OF WORK.

CONTACT YOUR LOCAL REPRESENTATIVE FOR ANY FURTHER INFORMATION REQUIRED.

By using this product, Buyer, and Buyer's past, present, and future agents, representatives, attorneys, affiliates, heirs, executors, assigns and successors, and all other persons or entities associated therewith, agrees that it will indemnify and hold harmless Plastec Ventilation Inc., and all of its past, present, and future agents, representatives, principals, attorneys, affiliates, owners, parent corporations, subsidiaries, officers, directors, employees, assigns and successors, and all other persons or entities associated therewith, against any and all claims, demands, causes of action, liabilities, damages, costs, and judgments, including attorney's fees, hereafter brought or asserted by any person or entity arising out of the design, installation or use of any Product(s) manufactured by Plastec Ventilation Inc under this Agreement and in accordance with Buyer's Specifications except for any intentional acts of Manufacture or any of Manufacture's employees, agents or contractors.

No claims, representations or warranties, whether expressed or implied, are made by Plastec Ventilation Inc as to the safety, reliability, durability, and performance of any of our companies' products. Furthermore, our company accepts no liability whatsoever for the safety, reliability, durability, and performance of any of our companies' products.

1.2 Storage

Store fans in a clean, dry location prior to installation to protect against the weather and corrosive atmospheres. If it is necessary to store equipment outdoors, protect it from the elements as much as possible. Keep equipment dry and clean. Cover inlets/outlets to prevent collection of moisture, dust, etc.

Records of stored equipment should be kept to assure proper procedures.

2 Safety Information

2.1 Safety Warnings

CAUTION! All electrical work must be done in accordance with local and /or national codes as applied. Work should be performed by qualified electricians.

WARNING! This product must be grounded.

DANGER! Make sure power is turned off and locked in the off position before installing, wiring, or servicing.

WARNING! Keep all wiring clear of rotating or moving parts.

3 Regulatory Compliance

3.1 Certifications

PLASTEC Ventilation certifies that the Constant Air Volume and Variable Air Volume Controllers Series shown here complied with EN14175 and RoHS Standards.

4 Warranty

PLASTEC Ventilation guarantees that its equipment, products, and components are warranted to be free from defects in material and workmanship for two years from date of original shipment. Any units or parts which prove to be defective and are reported during the warranty period will be replaced at our option when returned to our factory, transportation prepaid by the sender. Deterioration of wear by heat, abrasive action, chemicals, improper installation or operation or lack of normal maintenance shall not constitute defects, and are not covered by warranty. Transportation to and from the factory for warranty repairs is not covered under warranty and is the sole responsibility of the owner of the equipment.

The manufacturer will not be responsible for any installation, removal or re-installation cost or any consequential damage resulting in failure to meet conditions of any warranty.

LIMITATION OF WARRANTY AND LIABILITY: This warranty does not apply to any product or parts which have failed as a result of faulty installation or abuse, or incorrect electrical connections or alterations, made by other, or use under abnormal operating conditions or misapplications of the products and parts.

The manufacturer will not approve for payment any repairs made outside its factory without prior written consent. The foregoing shall constitute our sole and exclusive warranty and our sole and exclusive liability and is in lieu of all other warranties whether written, oral, implied,

or statutory. There are no warranties which extend beyond the description of the page hereof. Seller does not warranty that said goods and articles are merchantable quality or that they are fit for any particular purpose. The liability of seller on any claim of any kind, including negligence, for any loss or damage arising out of, or connected with, or resulting from the sale and purchase of the products and parts covered by this proposal, acknowledgment, order or from performance or breach of any contract pertaining to such sale or purchase, or from the design, manufacture, sale, delivery, resale, installation, technical direction of installation, inspection, repair, operation or use of any products or parts covered by this proposal, acknowledgment, order or furnished by seller shall, in no case exceed the price allocable to the product or parts thereof which give rise to the claim and shall terminate one (1) year after shipment of said products and parts.

In no event, whether as a result of breach of contract, or warranty or alleged negligence, defects, incorrect advise or other causes, shall seller be liable for special or consequential damages including, but not limited to, loss of profits or revenue, loss of use of the equipment or any associated equipment, cost of capital, cost of substitute equipment, facilities or services, down time costs or claims of customers of the purchaser for such damages. The manufacturer neither assumes nor authorizes any persons to assume for it any other liability in connection with the sale of its fan products and parts.

The receiver MUST report any missing equipment, accessories, or items from delivery within 60 days of the ship date. Any equipment, accessories, or items damaged within shipping MUST be reported within 60 days of the ship date. PLASTEC will NOT replace any equipment, accessories, or items missing from the shipment or equipment, accessories, or items damaged in shipment if it is not reported within 60 days of ship date. For further information, see **1.2** *Shipping and Receiving*

SAFETY ACCESSORIES WARNING: The responsibility for providing safety accessories for equipment supplied by the manufacturer is that of the installer and user of this equipment. The manufacturer sells its equipment with and without safety accessories, and accordingly it can supply such safety accessories upon receipt of order.

The user, in making its determination as to the appropriate safety accessories to be installed and any warning notices, should consider (1) the location of the installation, (2) the accessibility of employees and other persons to this equipment, (3) any adjacent equipment, (4) applicable building codes, and (5) requirements of the Federal Occupational Safety and Health Act.

Users and installers of this equipment should read, “RECOMMENDED SAFETY PRACTICES FOR AIR MOVING DEVICES” which is published by Air Movement and Control Association, 30 West University Drive, Arlington Heights, Illinois, 60004.

The invalidity or unenforceability of any particular provision in this document shall not affect the other provisions hereto, and this document shall be construed as though such invalid or unenforceable provisions were omitted.

5 PLASTEC Fume Hood Controllers

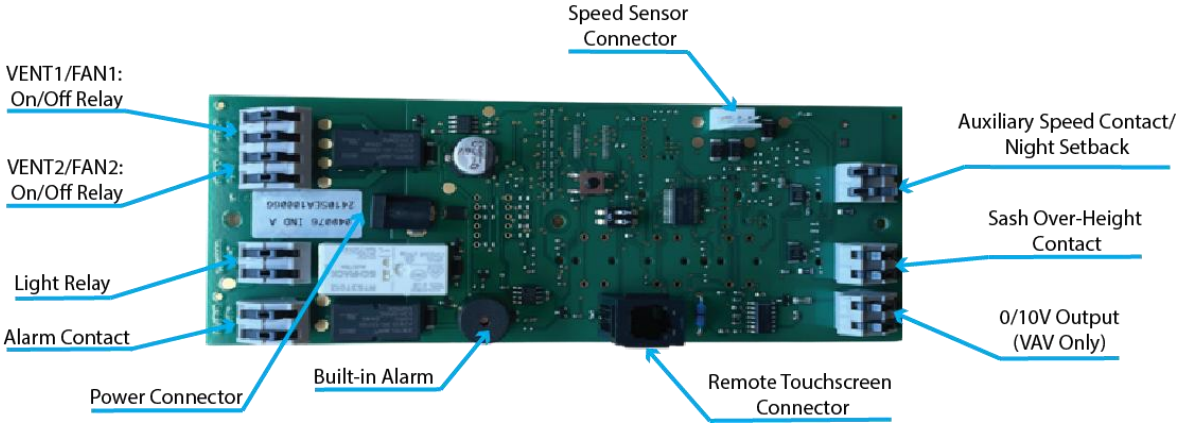
PLASTEC Fume Hood controllers in a variety of configurations, those being a constant air volume controller, variable air volume controller (PID), and a variable air volume controller with two speed settings.

All fume hood controllers come with an air speed sensor for monitoring the air velocity within the fume hood and a touchscreen interface for easy control, setup, and display.

5.1 General Information

5.1.1 Touchscreen

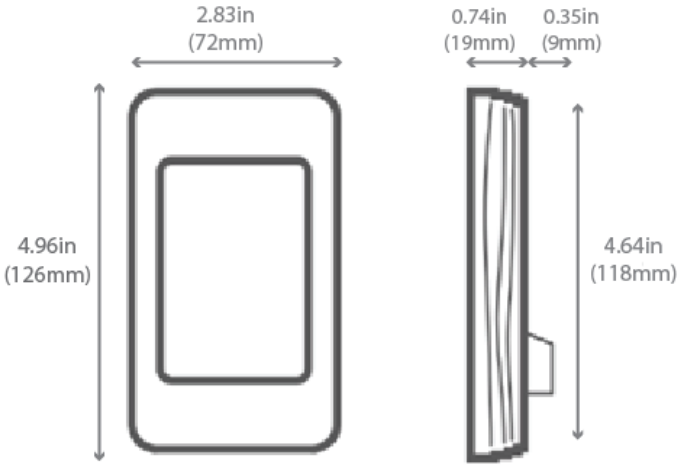
5.1.2 Processor and Connectors



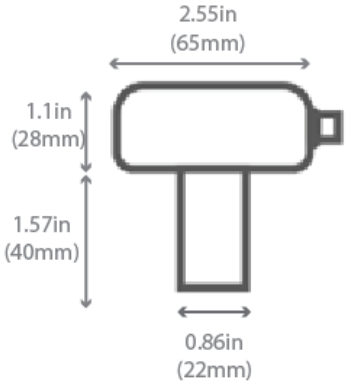
5.1.3 Processor Connector Specifications

Power Supply	230v/12v 500mA Wall Plug (Power Supply is Provided)
VENT1/FAN1	ON/OFF ventilation relay controlled by  Max Cut-Off Voltage: 120v Max Cut-Off Current: 0.5 A
VENT2/FAN2	Same as VENT1
0/10V (Only Available on VAV Models)	0/10v output which sends a voltage according to the speed measured by the speed sensor. This output must be sent to the variable frequency drive.
LIGHT	ON/OFF lighting relay controlled by  Max Cut-Off Voltage: 220v Max Cut-Off Current: 3 A
ALARM	Relay controlled by alarm activation. Normally open contact Max Cut-Off Voltage: 120v Max Cut-Off Current: 0.5 A
SASH Open	Sash contact which triggers a visual and audible alarm.
IDLE	Auxiliary speed contact which triggers a visual and audible alarm. This contact can be used to enable night standby mode by cutting the resistor shown on page 6.

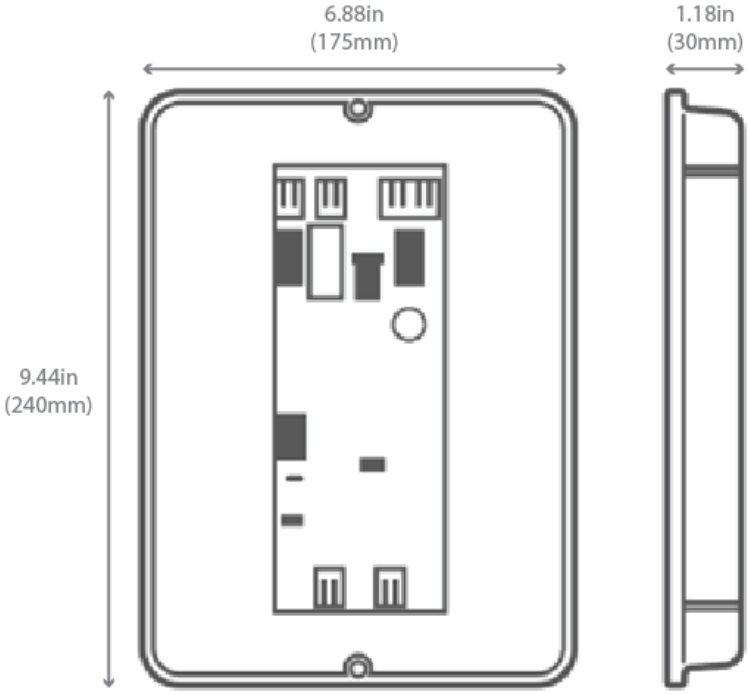
5.1.4 Hardware Dimensions



HMI



Speed Sensor



CPU box

5.2 Installation

The fume hood controller and included accessories must be installed correctly for accurate measurements and control.

When adjusting the controller during the setup process, ensure that all fans are operating properly. Also, ensure that the laboratory is completely closed, including doors and windows.

An anemometer will be required for calibration of the fume hood controller.

Ensure that the blower is correctly installed and that the motor is wired correctly. If the controller is the Variable Air Volume Controller, ensure that it is installed with a Variable Frequency Drive (VFD). The VFD must be correctly wired to both the blower motor and the fume hood controller for proper operation.

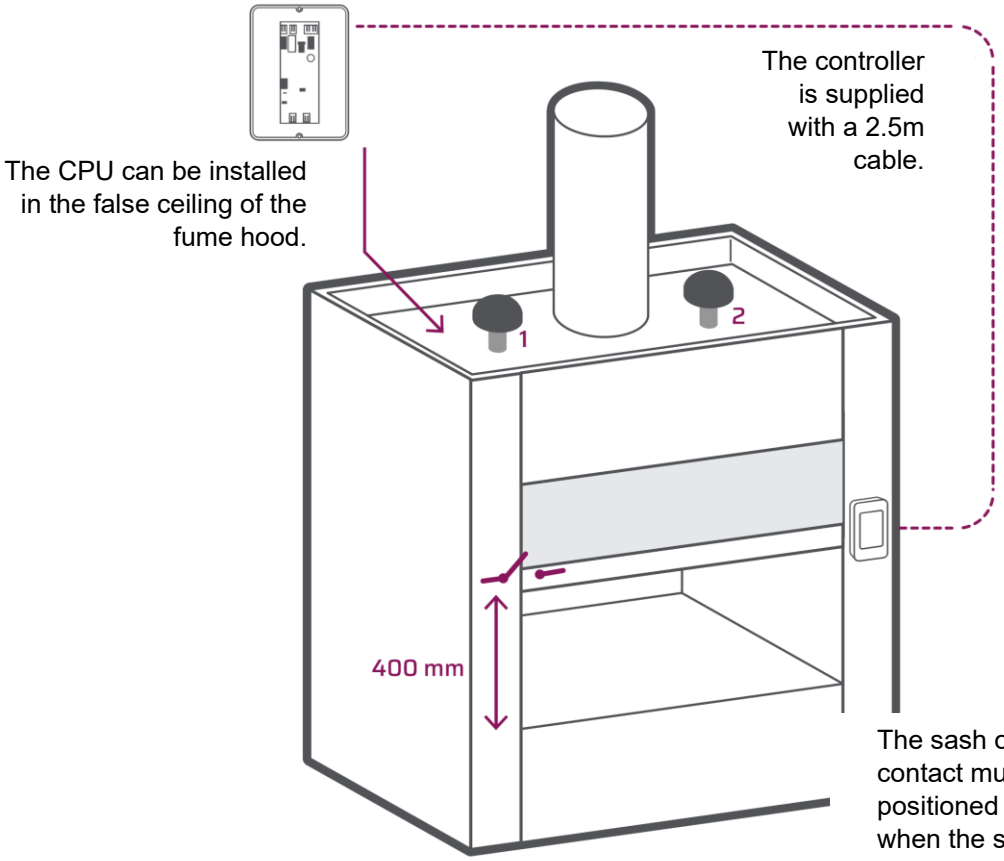
The Constant Air Volume Controller does not require a VFD.

5.2.1 Control Box Installation

It is recommended to install the HMI on the side of the fume hood. For installation instructions, see 5.2.3 *Touchscreen Installation* for further instructions.

The controller can be installed with in the false ceiling of the fume hood. It does not need to be mounted to the fume hood directly but may need to remain accessible. If the fume hood as compartments on either side of the sash, the controller can also be installed in said compartments.

If it is desired to mount the controller to the side of the fume hood, the controller does come with designated holes for securing it to the fume hood. It also comes with a protective cover to prevent any damage to the controller.



5.2.2 Speed Sensor Installation

The Speed Sensor must be installed on the top of the fume hood. Installing the Speed Sensor in a dead zone or in the extraction ducting will obstruct measurements and thus inhibit proper operation of the fume hood controller.

DO NOT INSTALL SENSOR IN DUCT ATTCHED TO FUME HOOD

The Speed Sensor must pass through the ceiling of the fume hood. If this is not possible, a PVC tube/duct can be installed on the sensor's outlet to extend the sensor. A minimum velocity of 0.2 m/s or 40 FPM must be measured for proper operation.

If the ceiling is not accessible, the speed sensor can be installed on the side of the fume hood.

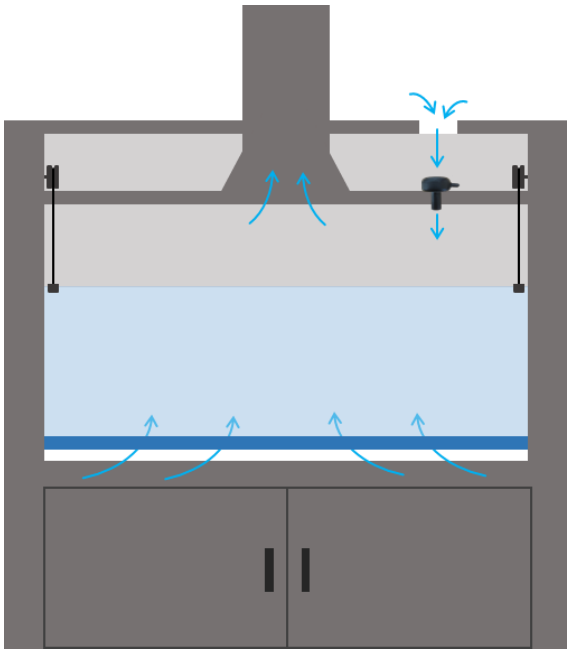
When installing the speed sensor, a 22mm hole will need to be drilled in the desired mounting location. It is recommended to use a 22mm or 7/8in drill bit or hole cutting bit to drill the hole.

The speed sensor comes pre-equipped with an adhesive gasket. To fully install the speed sensor and properly seal it against the fume hood, the protective film must be removed from the adhesive before installing.

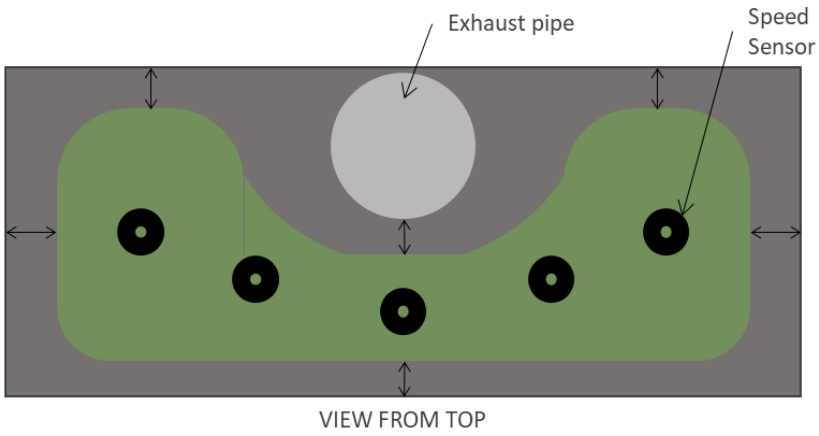
Ceiling Mounted

If the speed sensor is being installed in the ceiling of a fume hood with a false ceiling, a hole will need to be drilled for the speed sensor to be installed and through the top of the fume hood. The speed sensor requires access to ambient air for proper readings. In the case where the speed sensor cannot be installed within the false ceiling, the sensor can be installed on the top of the fume hood and have a PVC duct extension to the interior of the fume hood.

If the fume hood does not have a false ceiling, the sensor can be directly installed through the top of the sensor.

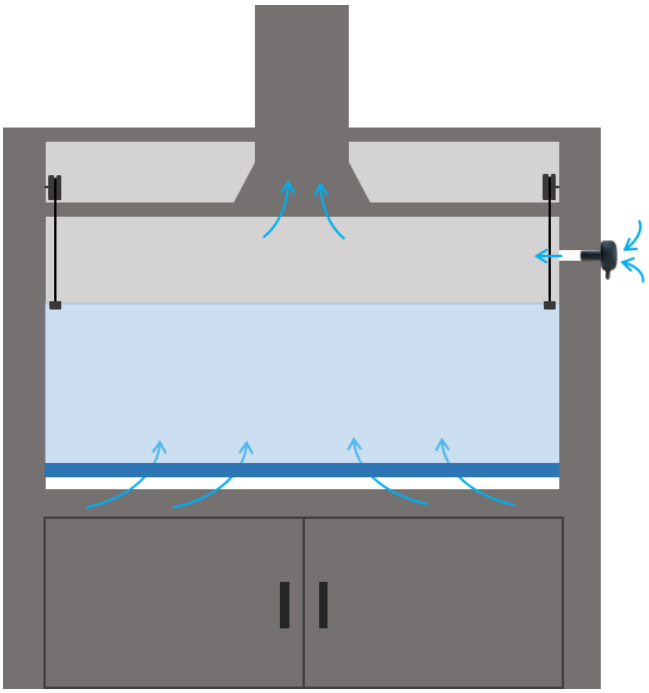


The speed sensor cannot be installed within a dead zone. Installing the sensor in a dead zone will result in inaccurate speed measurements. When installing the sensor, it is recommended to avoid proximity to the edges of the fume hood or being too close to the duct. The diagram below shows the green zone and possible installation positions for the speed sensor. It is recommended that the sensor is installed within the green zone for the best possible measurements.

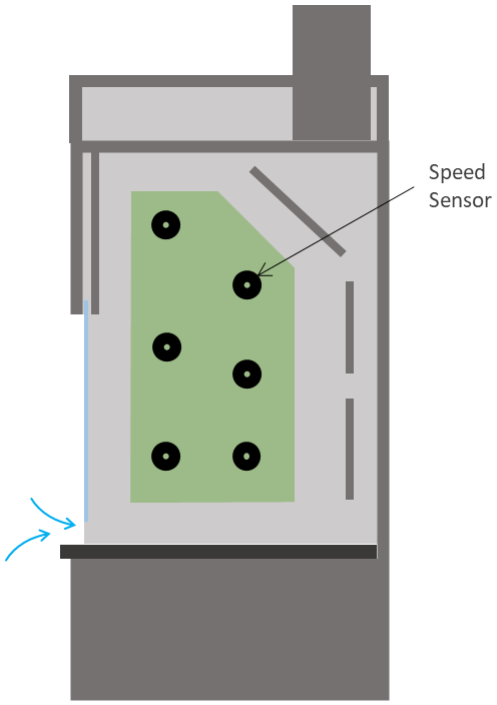


Side Mounted

If the speed sensor cannot be installed on top of the fume hood, it can be installed on the side of the fume hood. Installing the sensor will follow the same procedure as installing in the ceiling of the fume hood.



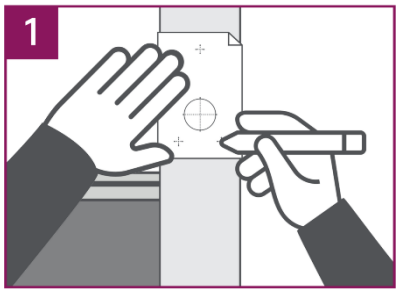
As previously mentioned, the speed sensor needs to be installed within the green zone detailed below and away from the edges or baffles. This will provide the best possible measurements from the speed sensor and allow for accurate readings.



VIEW FROM SIDE

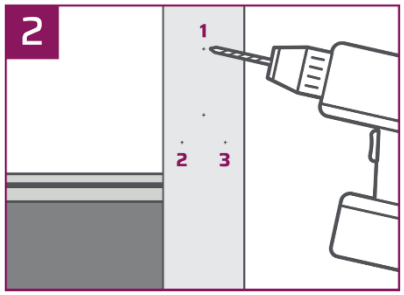
5.2.3 Touchscreen Installation

PLASTEC's fume hood controllers come with a template for ease of installation. It is recommended to use the template for installing the touchscreen onto the fume hood.

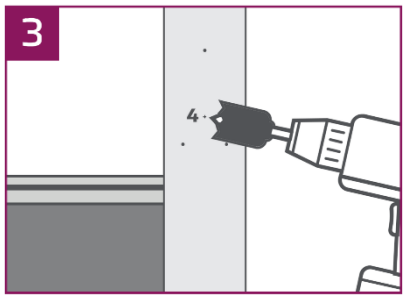


With the provided template located inside the processor control box house, mark and drill the holes where the unit will be installed onto the fume hood.

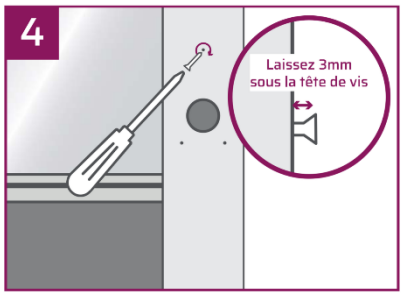
Ensure the template is positioned level before drilling.



Drill the previously marked holes using a 2mm or 0.075in. Ensure the drill bit is suitable for the fume hood material.

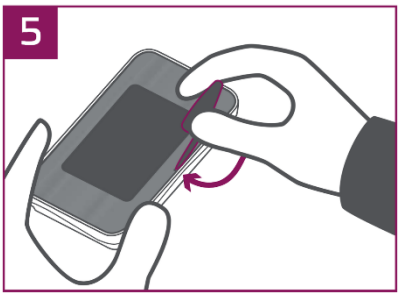


Drill the center hole using a 35mm or 1 $\frac{3}{8}$in center hole bit.



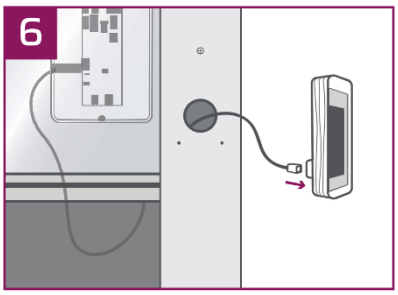
Install the one of the provided screws into the topmost hole drilled.

When installing the screw, leave about 3mm or 0.1in of space between the screw and the fume hood. The provided template can be used to set the distance.

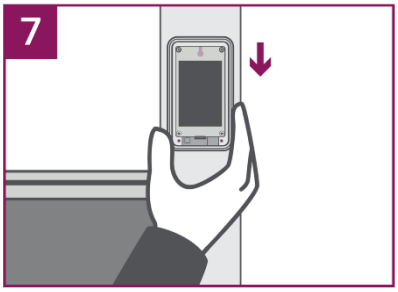


Remove the face plate of the touchscreen using a plastic pry or trim tool.

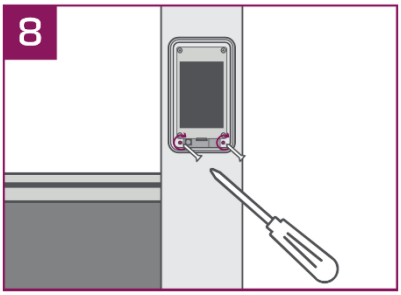
Carefully insert the pry tool into the notch at the front of the touchscreen and gently pry open.



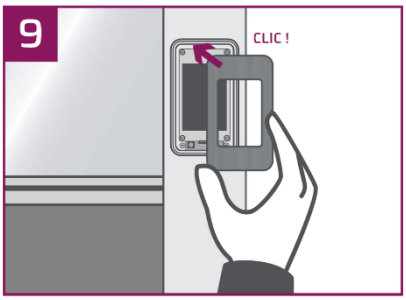
Connect the touchscreen cable to the processor. Pass the cable through the previously drilled center hole and connect it to the rear of the touchscreen.



Hang the touchscreen on the screw inserted into the topmost hole. Gently pull the touchscreen down to align the bottom holes with the holes in the touchscreen.



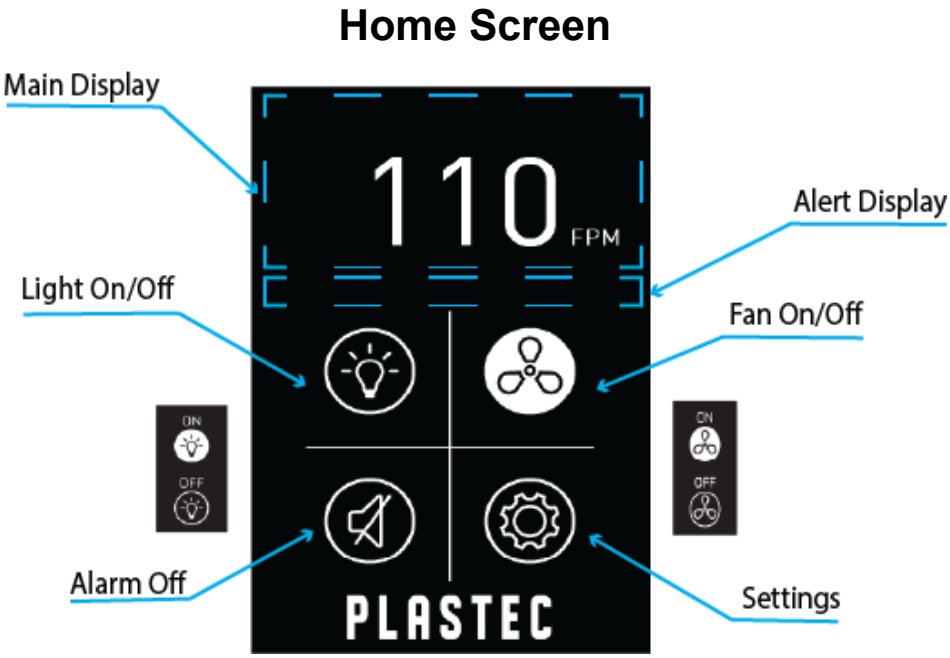
Insert the remaining two screws into the touchscreen to firmly secure the touchscreen to the fume hood.



Align the touchscreen faceplate with the touchscreen and gently press. The faceplate should snap into place after doing so.

5.1 Navigation and Settings

5.1.1 Menu Navigation

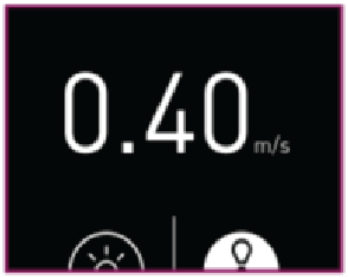


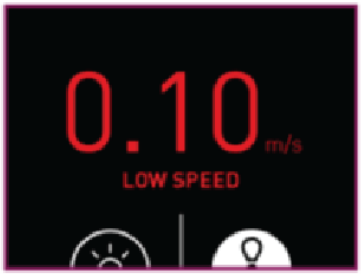
Main Display

Speed Display ON

White Value:
Airflow OK

Red Value:
Insufficient Airflow





Speed Display OFF

Ventilation OK Icon:
Airflow OK

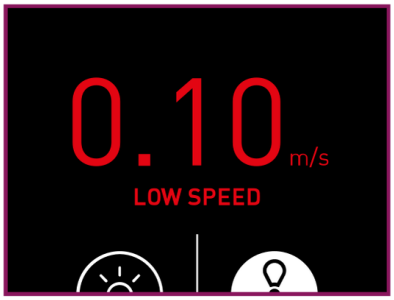
Warning Icon:
Insufficient Airflow

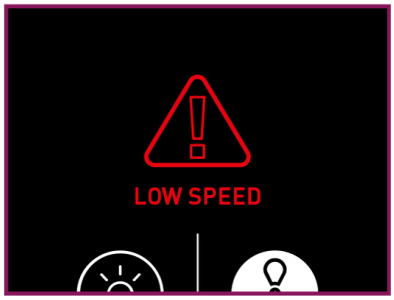
In the event of a malfunction, the alarm sounds, and the display shows the corresponding error message to the user.

The alarm can be muted temporarily. The user can silence it by pressing the MUTE ALARM button

Home Screen Alert

Insufficient air flow





When the airflow is insufficient for the fume hood the alarm will sound. The speed value or icon will turn red on the display and the message **LOW SPEED** will appear.

SASH OVER-HEIGHT, SPEED SENSOR DISCONNECTED, AUXILIARY FAULT

The alarm sounds. The lower sash icon and a message prompt the user to lower the sash.

The alarm sounds. The screen indicates that the speed sensor is either unplugged or does not work.

The alarm sounds. The screen indicates a problem on the auxiliary input.

RELATED ALERT

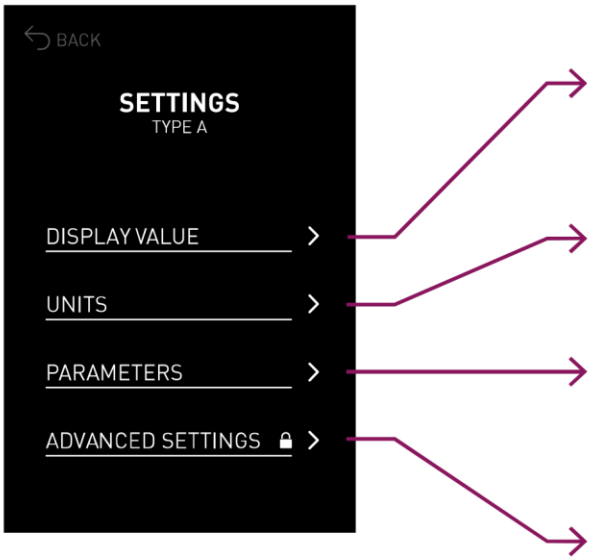
Connection with CPU lost

An alert screen may appear if communication between the HMI and the CPU is interrupted.

To continue using the controller, the connection must be re-

5.1.2 Settings

The settings menu can be accessed by clicking on the button:



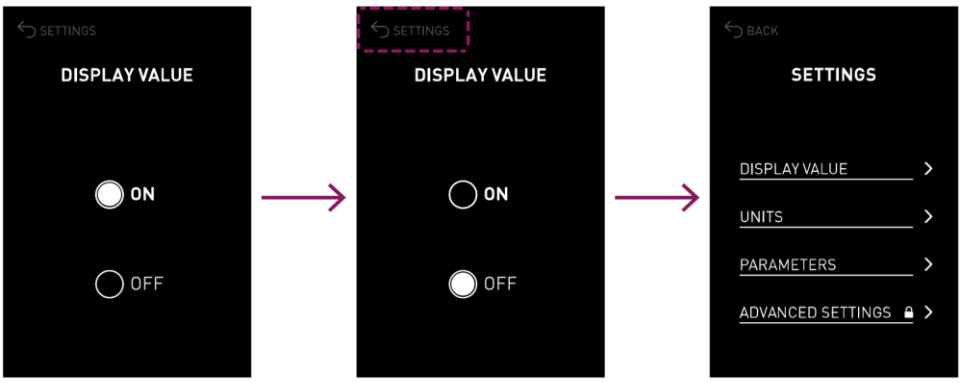
SPEED DISPLAY SETTING
Allows you to display (ON) or HIDE (OFF) the speed value on the home screen.

CHOICE OF
m/s or FPM UNITS

CURRENT CONFIGURATION
Allows you to view the current controller configuration (for type A = configured front speed)

ACCESS TO ADVANCED SETTINGS
Menu for technicians, access is by password

Example of the speed display setting (This logic applies to other parameters that require a selection):



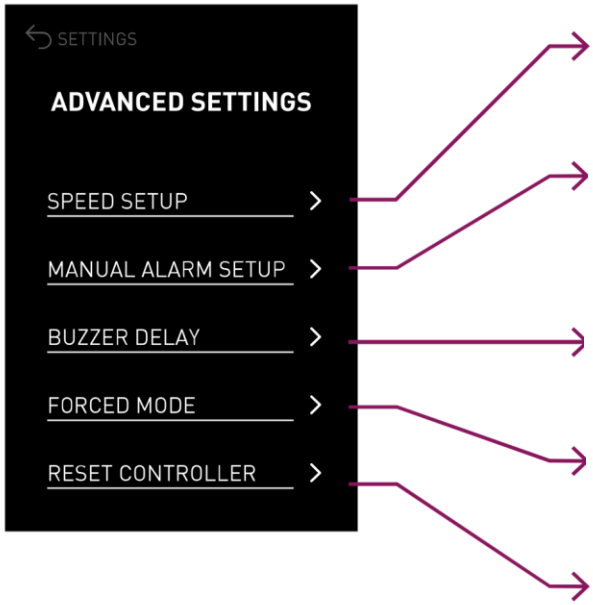
ON selected: The speed value will be displayed on the screen.

OFF selected: The speed value will be hidden and replaced by a pictogram (see page 15).

To confirm the setting and return to the previous menu, press the SETTINGS button in the top-left corner of the screen.

5.1.3 Advanced Settings

The advanced settings menu is a password-protected menu and is intended for technicians. The advanced settings provide access to the controller's fine-tuning and configuration settings. Access and the configuration procedure are detailed below.



ACCESS CONFIGURATION PROCEDURE
For Type A: synchronization of the front speed display.

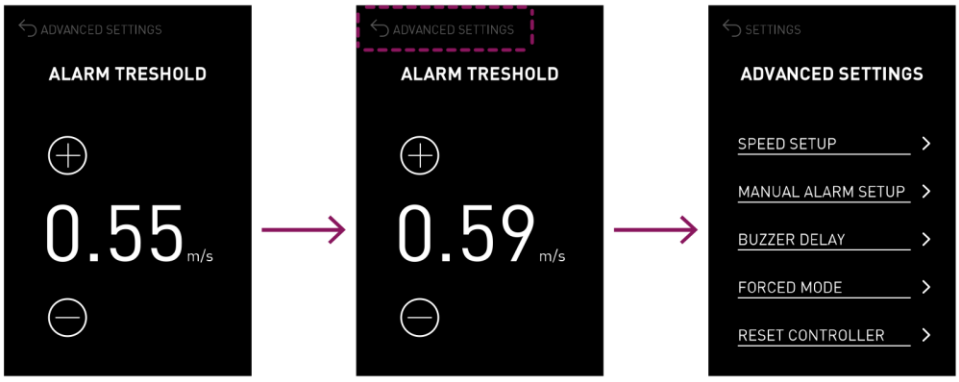
ALARM THRESHOLD
Fine adjustment of the alarm threshold:
From 0.2 m/s to 1 m/s (increment: 0.01 m/s)
Or from 40 to 200 FPM (increment: 2 FPM)

BUZZER TIMER
Buzzer timer setting: adjustable from 0 to 60 seconds, in 10-second increments.

FORCED MODE
In forced ventilation mode, the ventilation cannot be turned off from the home screen.

RESTORE FACTORY SETTINGS

Alarm-Threshold Setting



Pressing + or – adjusts the value by 0.01.

Pressing Advanced Settings confirms the setting and returns to the previous menu.

6 Constant Air Volume Controller (CAV)

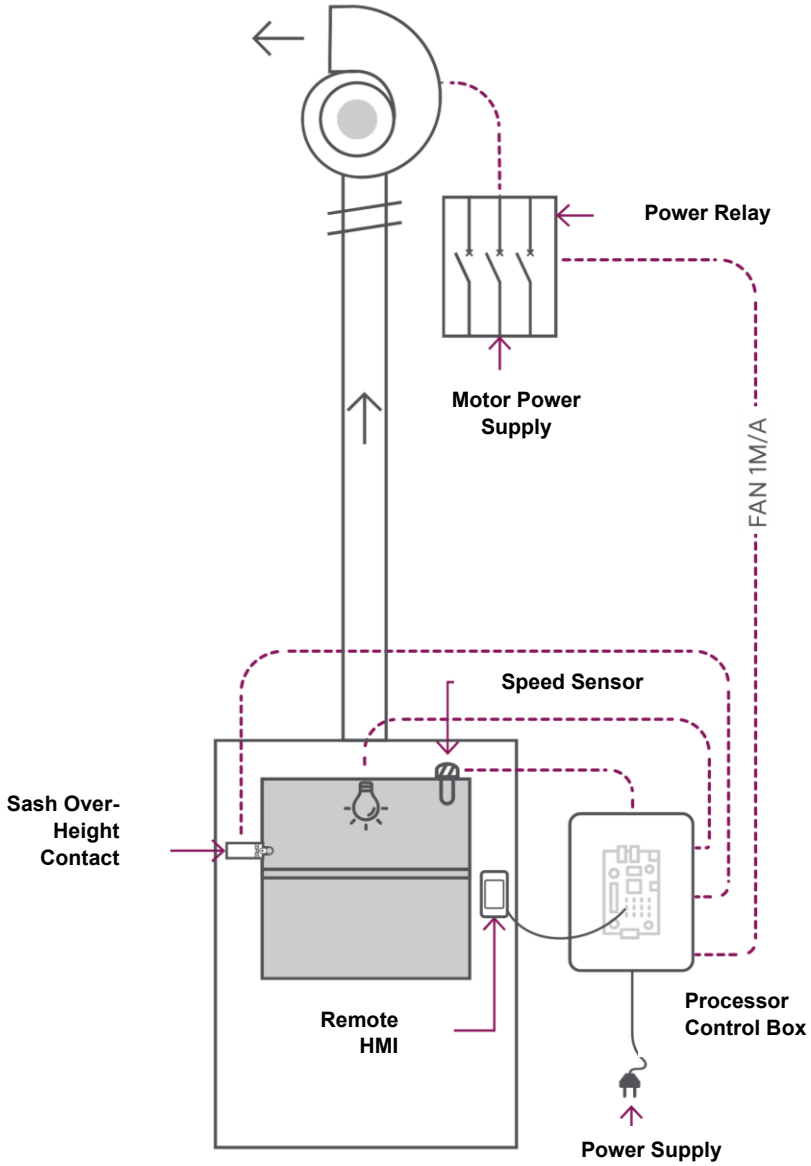
The remote Constant Air Volume (CAV) controller is a safety device for monitoring fixed air flow.

The supplied speed sensor is used to determine the flow rate. An Audible and visual alarm is set off if insufficient speed air speed is detected or if the sash height is too high.

The HMI allows for easy control of the ventilation in fume hood and allows for adjustments to be made on site.

6.1 General Information

6.1.1 Installation Diagram



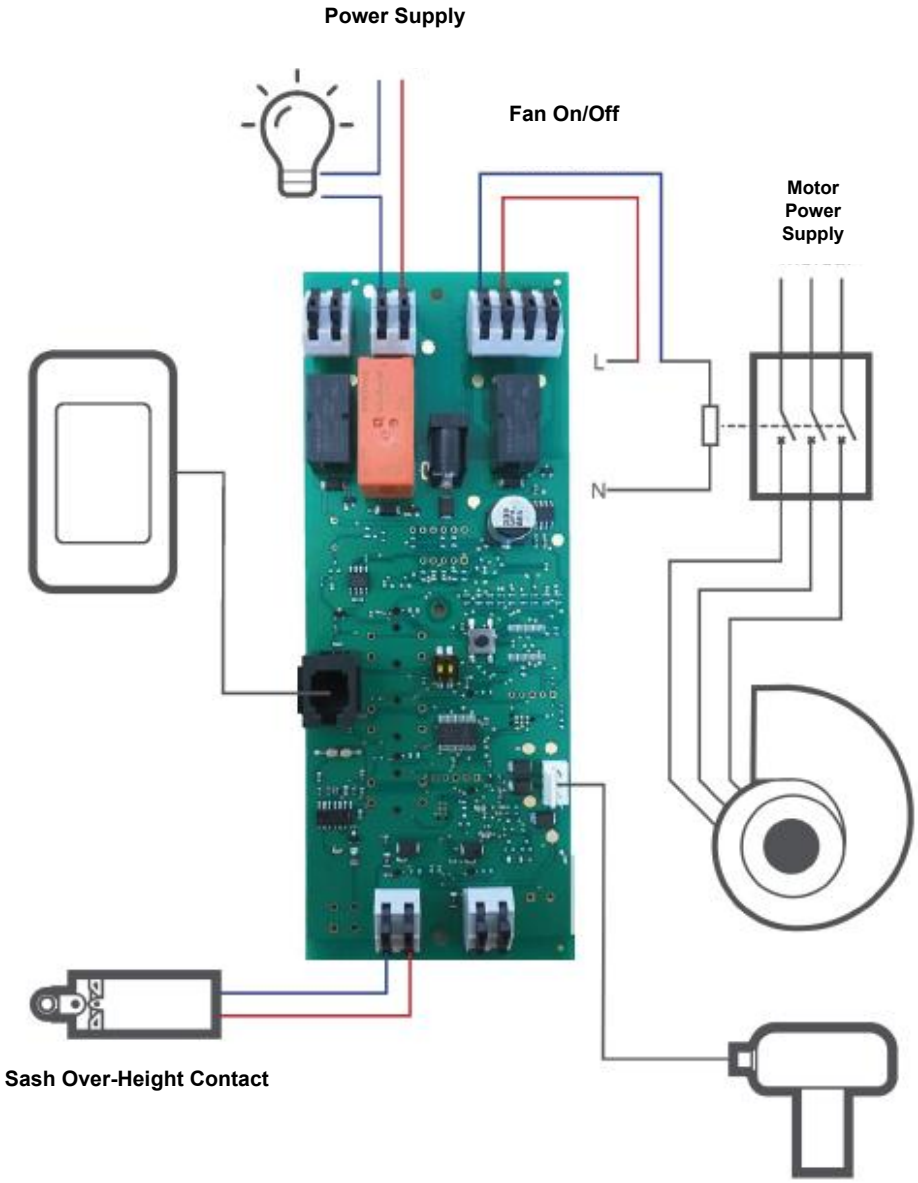
The **CAV** flow controller is used to manage the air flow of a fume hood.

Pressing the ON/OFF ventilation button on the remote interface closes the two relays VENT 1 and VENT 2, which supplies the fan via a power relay. It is a **fixed flow** controller.

The speed sensor allows the controller to measure whether the air flow is sufficient and displays the status on the screen.

6.2 Installation

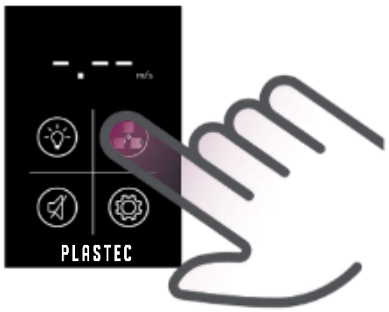
6.2.1 Wiring Diagram



6.1 Controller Configuration and Setup

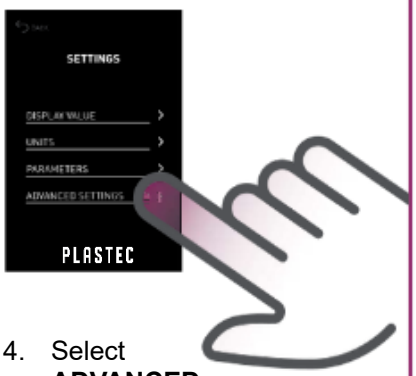
6.1.1 Controller Setup

1. Touch the screen to exit standby mode



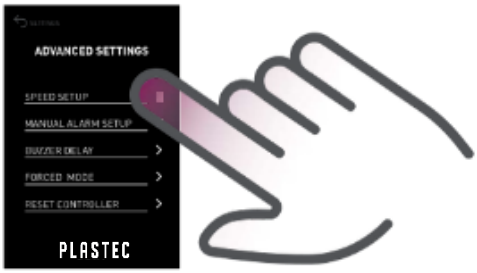
2. Turn on the fan by pressing the fan button

3. Tap the settings button



4. Select **ADVANCED SETTINGS**

5. Enter Access Password: **1000**



6. Select **SPEED SETUP**

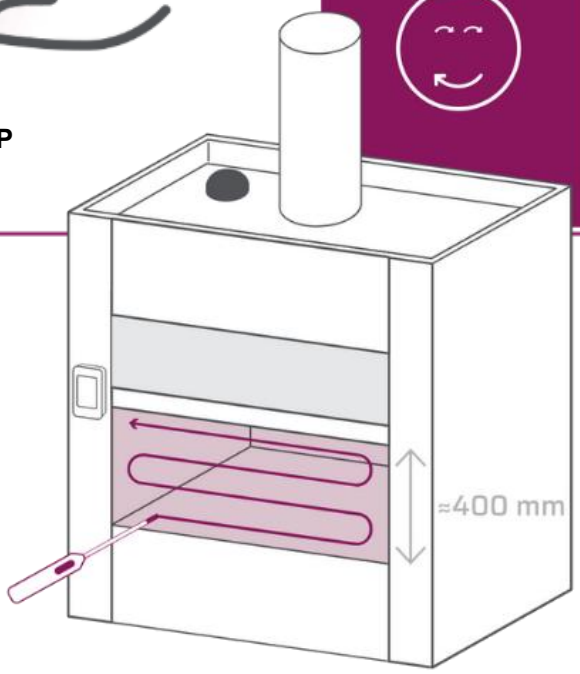
YOU ARE IN CONFIGURATION MODE

SYNCHRONIZED FRONT-SPEED DISPLAY

7. Raise the fume hood sash to the high position (approximately 400 mm).

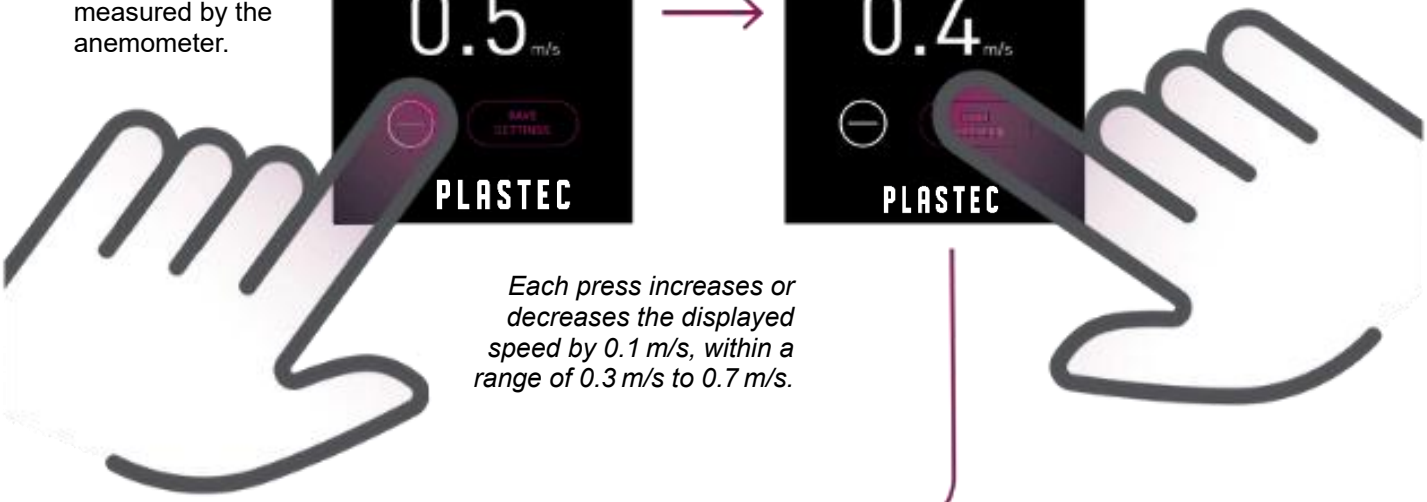
8. Wait 15 seconds for the airflow to stabilize, then use an anemometer to measure the face velocity by scanning the entire sash opening.

The measured speed must be greater than 0.4 m/s.



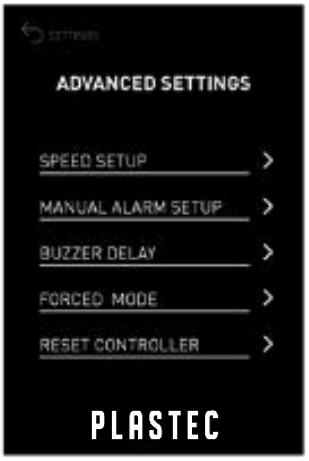
9. Use the + and – buttons to synchronize the speed displayed on the HMI with the value measured by the anemometer.

10. Save your settings by pressing the **SAVE SETTINGS button.**



Each press increases or decreases the displayed speed by 0.1 m/s, within a range of 0.3 m/s to 0.7 m/s.

11. A confirmation message appears for 3 seconds to indicate that the configuration has been saved.

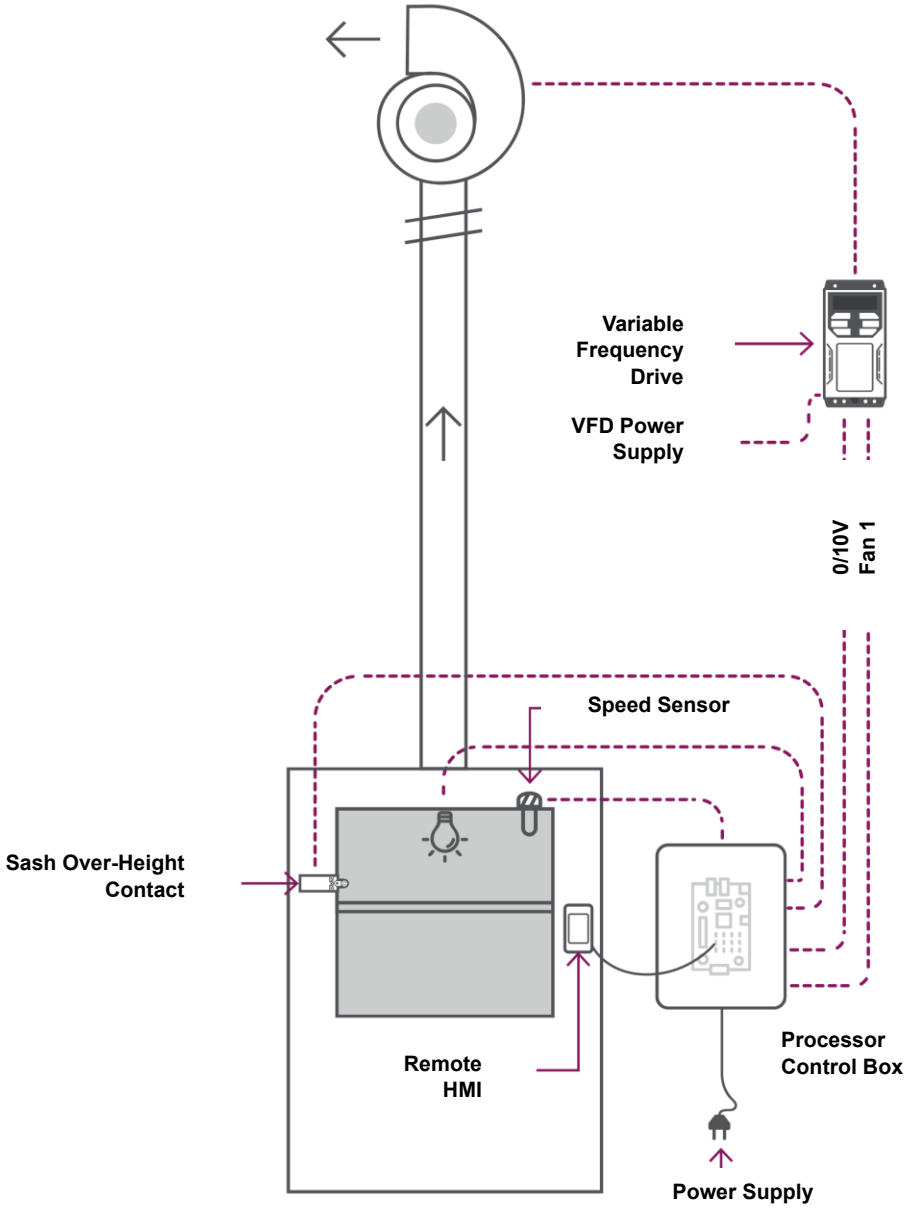


12. The speed is now synchronized. The Type A controller is ready for use.

7 Variable Air Volume Controller (VAV)

7.1 General Information

7.1.1 Installation Diagram



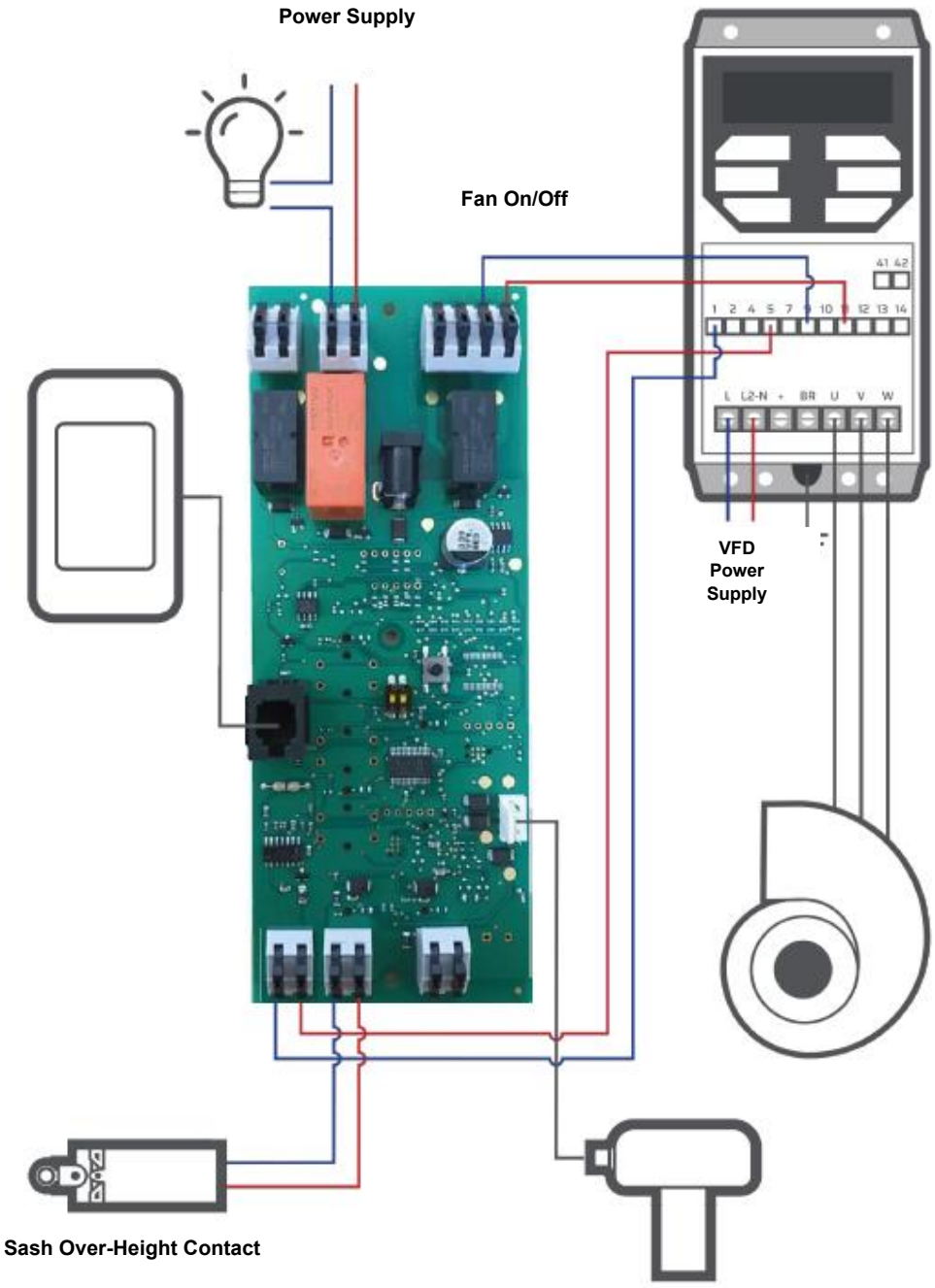
The VAV PID Controller is used to control the airflow of a fume hood.

Pressing the ON/OFF ventilation button on the remote interface closes the two relays VENT 1 and VENT 2, which enables the variable frequency drive. The controller then sends a 0/10v signal to the VFD, which will change the motor speed and the flow rate. This is a PID controller.

The speed sensor allows the controller to measure whether the air flow is sufficient and adjust the flow of the blower to maintain the proper air speed.

7.2 Installation

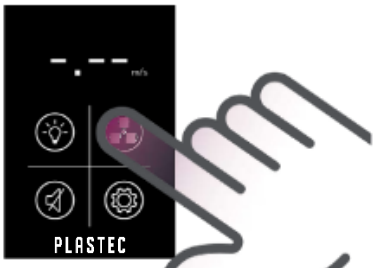
7.2.1 Wiring Diagram



7.3 Controller Configuration and Setup

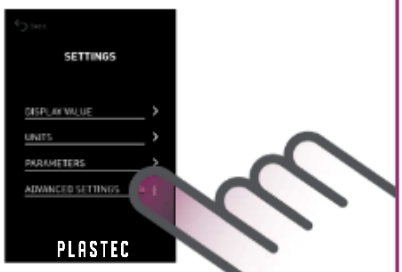
7.3.1 Controller Setup

1. Touch the screen to exit standby mode



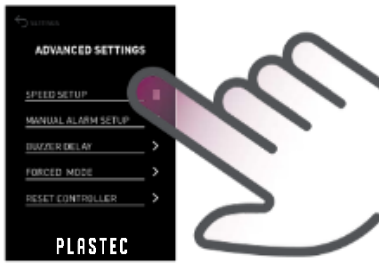
2. Turn on the fan by pressing the fan button

3. Tap the settings button

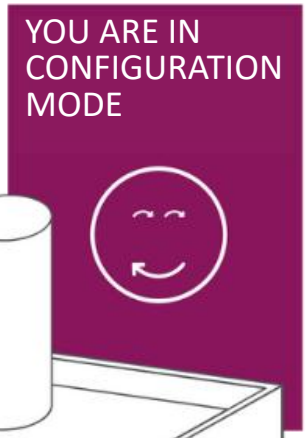


4. Select **ADVANCED SETTINGS**

5. Enter Access Password: **1000**



6. Select **SPEED SETUP**

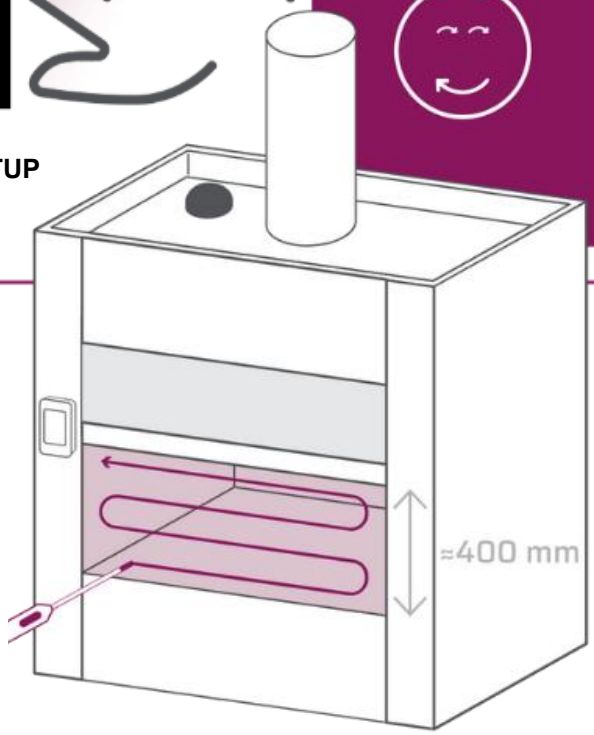


SYNCHRONIZED FRONT-SPEED DISPLAY

7. Raise the fume hood sash to the high position (approximately 400 mm).

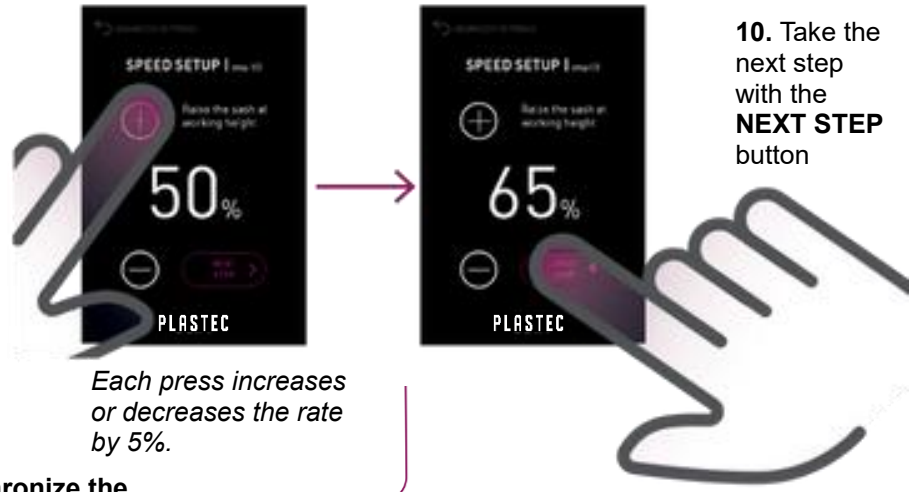
8. Wait 15 seconds for the airflow to stabilize, then use an anemometer to measure the face velocity by scanning the entire sash opening.

The measured speed must be greater than 0.4 m/s.



Step 1/2: Set the air extraction rate so that the actual measured speed is >0.4m/s on the anemometer

9. If the speed displayed on the anemometer is too low, increase the extraction rate until you measure a value > 0.4m/s.



Each press increases or decreases the rate by 5%.

10. Take the next step with the **NEXT STEP** button

Step 2/2: Synchronize the frontal speed display

11. Using the + and – buttons, synchronize the speed read on the anemometer and the speed displayed on the HMI.

12. Save your settings with the **SAVE SETTINGS** button

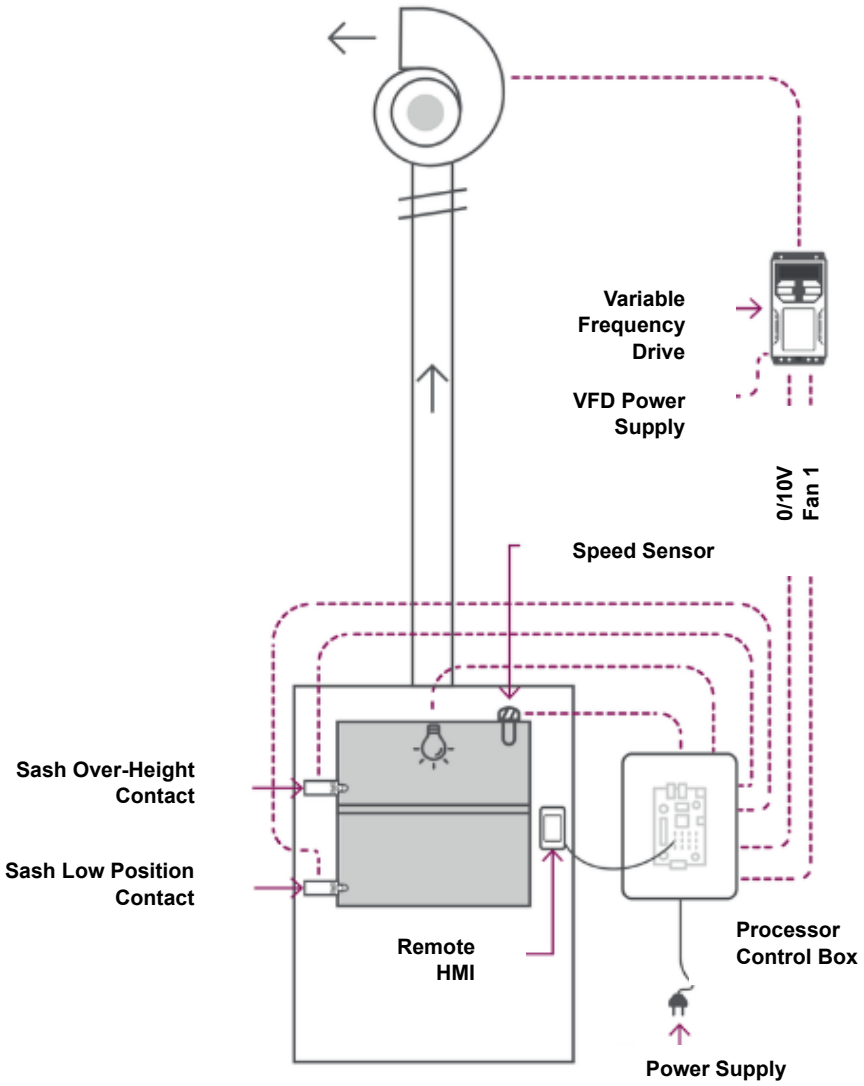
13. A confirmation message appears for 3 seconds to indicate that the configuration has been saved.

14. The speed is now synchronized. The Type C controller is ready for use.

8 Variable Air Volume 2-Speed Controller (VAV 2-Speed)

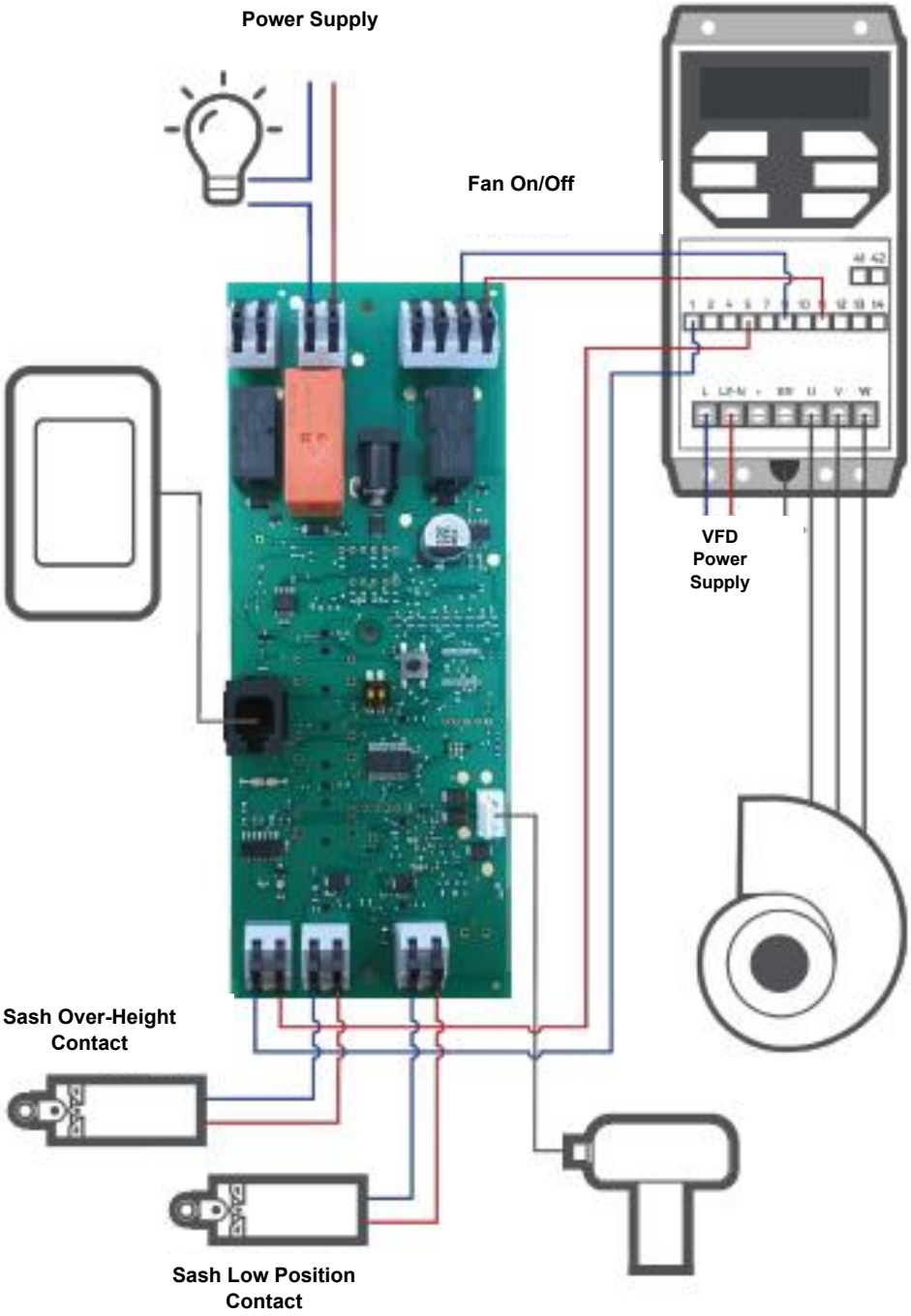
8.1 General Information

8.1.1 Installation Diagram



8.2 Installation

8.2.1 Wiring Diagram

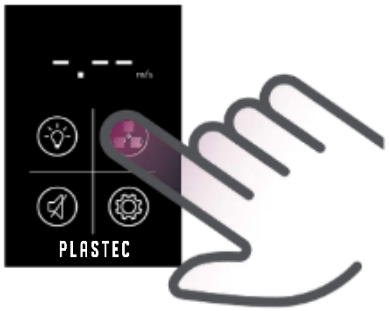


8.3 Controller Configuration and Setup

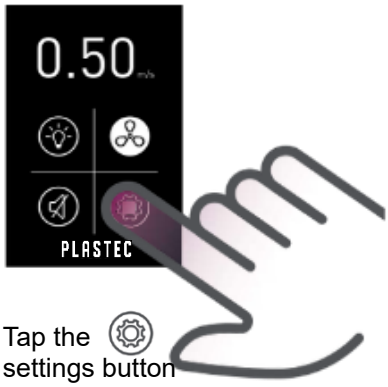
8.3.1 Controller Setup

ACCESS TO THE CONFIGURATION PROCEDURE

1. Touch the screen to exit standby mode



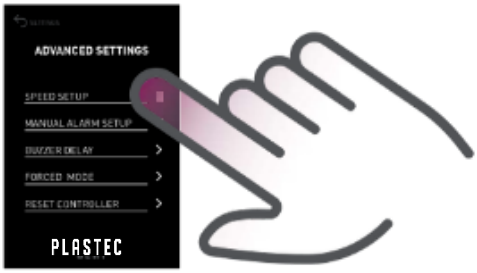
2. Turn on the fan by pressing the fan button



3. Tap the settings button

2. Select **ADVANCED SETTINGS**

4. Enter Access Password: **1000**



5. Select **SPEED SETUP**

SYNCHRONIZED FRONT-SPEED DISPLAY

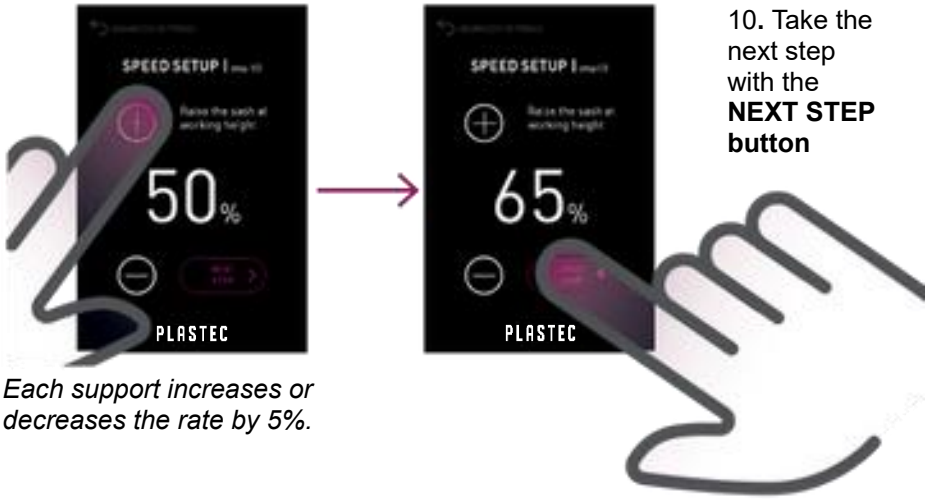
7. Raise the fume hood sash to the high position (approximately 400 mm).

8. Wait 15 seconds for the airflow to stabilize, then use an anemometer to measure the face velocity by scanning the entire sash opening.

The measured speed must be greater than 0.4 m/s.

Step 1/3: Adjust the air extraction rate of the low speed

9. If the speed displayed on the anemometer is too low, increase the extraction rate until you measure a value > 0.4m/s.



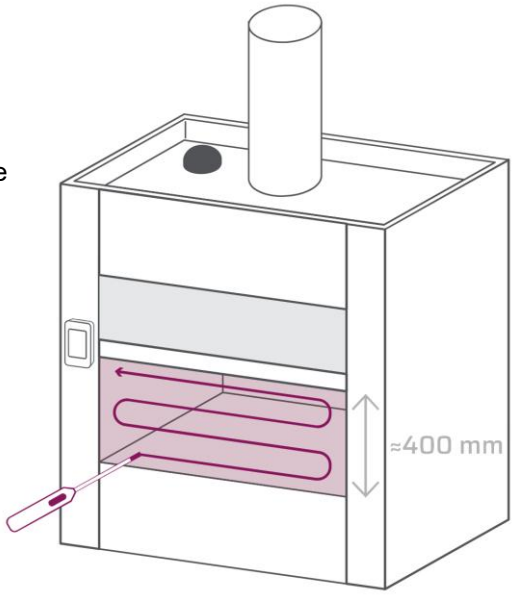
Each support increases or decreases the rate by 5%.

10. Take the next step with the **NEXT STEP button**

Step 2/3: Set the extraction rate of the high speed

11. Mount the fume hood glass in the high position (about 400mm)

12. Wait 15 seconds for the speed to stabilize and use an anemometer to measure the speed over the entire opening surface. The measured speed must be >0.4m/s over the entire surface.



13. If the speed displayed on the anemometer is too low, increase the extraction rate until you measure a value > 0.4m/s.

14. Take the next step with the **NEXT STEP button**

Each support increases or decreases the rate by 5%.

Step 3/3: Synchronize the Forward Speed Display

15. Use the + and – buttons to synchronize the speed displayed on the HMI with the value measured by the anemometer.

16. Save your settings by pressing the **SAVE SETTINGS button.**

17. A confirmation message appears for 3 seconds to indicate that the configuration has been saved.

18. The high and low speeds are set and synchronized, **the C2V type controller is now ready for use.**

9 Troubleshooting, Maintenance, and Questions

Before performing any maintenance on the controller, be sure power is turned off and locked in the off position at the service entrance.

9.1 Troubleshooting Procedures

Problem	Possible Causes	Solution
No Indicators/HMI has no display	Controller is not properly wired or plugged in	Check to see that all power connectors are properly connected. Check both the controller side and wall side of the power connector.
	HMI cable is not installed correctly	Check to see if the cable is fully seated in the controller and backside of the HMI. Check the cable for any potential damage that may have occurred during installation.
Light does not turn on	Light is not receiving power	The light must receive power from the wall. The controller does not provide power, only acts as normally open contact
Fan does not turn on	Power relay is not installed correctly (CAV Only)	Check to see if the blower and power relay are properly wired. The controllers' contacts only act to tell the power relay to close.
	VFD is not enabled (VAV Only)	Ensure that the FAN contacts are wired to the correct terminals on the VFD. Ensure that the VFD has the correct programming for the blower. Please see PLASTEC's VFD IOM for further details
	Blower related issues	For further information, please see PLASTEC's individual blower IOMs
Frontal speed is too low	Blower not running in the correct direction	Ensure that the blower is running in the correct direction (CCW or CW). For further information, please see PLASTEC's individual blower IOMs
	Setup not performed correctly	Refollow the adjustment and setup procedure to ensure that the controller is correctly adjusted for the fume hood and blower.

Frontal speed is too high	Blower is not installed correctly	Please ensure that the blower is properly installed according to PLASTEC's individual IOMs
Alarm sounds too often	Alarm settings set incorrectly	Verify that the alarm settings are correctly set and not set to sound too often. The delay can be adjusted as needed.
Air speed does not change (VAV Only)	VFD is not wired correctly	Ensure that the FAN contacts are wired to the correct terminals on the VFD. Ensure that the VFD has the correct programming for the blower. Please see PLASTEC's VFD IOM for further details