PREMIUM HVLS FANS — PRODUCT DOCUMENTATION

PANDORA V150e

Gearless Direct-Drive PMSM HVLS Ceiling Fan

High Volume Low Speed (HVLS) Fan · 1.5 m – 3.0 m Series



INSTALLATION, OPERATION & MAINTENANCE GUIDE

Please read this guide carefully before installation and operation.

HAMILTON AIR ENGINEERING
Industrial Ventilation & Premium Architectural Fans — Vietnam

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1. Product Overview

The Pandora V150e is a gearless, direct-drive PMSM (Permanent Magnet Synchronous Motor) HVLS ceiling fan engineered for wide-span air movement in commercial and industrial interiors. Its brushless motor architecture delivers up to 30% greater efficiency than conventional motors while operating in near-silence, and its high-torque, low-speed characteristics allow smooth start-up and stable operation across the full HVLS speed range.

Intelligent speed control continuously adjusts airflow for optimal comfort and energy savings, while the rugged, maintenance-free motor construction is engineered for long-term reliability with minimal upkeep. Compact and aerodynamic in profile, the Pandora V150e combines industrial-grade performance with the architectural elegance that defines the Hamilton Air product line — a smart, long-term investment in sustainable climate control.

Typical Applications

- **Public & Commercial Centers —** Supermarkets, shopping malls, wholesale markets, exhibition centers, showrooms, automobile service centers.
- **Manufacturing & Logistics —** Industrial factories, workshops, warehouses, transit centers, parcel sorting facilities.
- **Hospitality & Leisure —** Large-scale playgrounds, parks, travel resorts, scenic attractions, food courts.
- **Sports & Recreation —** Stadiums, gyms, indoor training centers.
- **Public Transport —** Waiting rooms, platforms, ticket offices, terminal buildings, bus stations.
- **Other Applications —** Agricultural facilities, wineries, churches, restaurants, classrooms, auditoriums.

Operating Conditions

- For indoor installation only, in environments free of flammable gases, corrosive vapors, or conductive dust.
- Installation must follow this manual precisely, with all fixing screws correctly tightened and torqued.
- After installation, visually confirm — from a position roughly 2 m below the fan — that the unit hangs level and rotates horizontally.
- Maintain a minimum clearance of 30 cm between the fan blades and any surrounding obstacle.
- Minimum installation height, floor to blade: 2.5 m.
- If the extension rod exceeds 100 cm in length, SS304 stainless steel safety wire ropes and security bolts must be installed to stabilize fan operation (see Section 10).
- 220 V power supply: input voltage range 160–260 V, 50/60 Hz. 110 V power supply: input voltage range 100–140 V, 50/60 Hz.
- Ambient temperature range: -10℃ to 45℃. Relative humidity: 95% maximum, non-condensing.

2. Safety Cautions

Ceiling-mounted HVLS fans involve rotating machinery, electrical connections, and installation at height. Read and observe every caution below before beginning work.

Before You Begin

- Read this manual in full before installation or operation.
- Inspect every component immediately after unboxing; do not proceed if any part is missing, defective, or damaged in transit — contact Hamilton Air immediately.
- Store all components securely, out of reach of children, the elderly, or vulnerable individuals.

Installation Safety

- Installation, wiring, and motor grounding must be performed only by qualified, trained personnel.
- When drilling near the control panel, prevent metal shavings or debris from entering the enclosure.
- After installation, verify that the fan is level and balanced in both the horizontal and vertical planes.
- Confirm the local power supply matches the fan's rated voltage and frequency before energizing the unit.
- This fan is designed for indoor ceiling mounting only. Unauthorized modification or misapplication voids the warranty; Hamilton Air is not liable for resulting damage or injury.

Operating Safety

- Never operate the fan with wet hands or in wet conditions — risk of electric shock.
- Only authorized technicians may access the control panel during operation.
- Maintain the required clearance zone around the rotating blades at all times and remove any obstacles within the rotation radius.
- Never touch the moving blades with tools, objects, or any part of the body.
- Non-compliance with these instructions may result in injury or equipment failure. Hamilton Air disclaims liability for accidents caused by negligence.

3. Technical Specifications

PANDORA V150e	D1500	D2000	D2500	D3000
Diameter	1,500 mm (60 in)	2,000 mm (80 in)	2,500 mm (100 in)	3,000 mm (120 in)
Blade Quantity	6	6	6	6
Weight	18 kg	20 kg	22 kg	24 kg
Power	100 W	110 W	180 W	280 W
Max Speed	180 rpm	120 rpm	105 rpm	95 rpm
Max Air Volume	1,750 m^3/min	2,130 m^3/min	2,750 m^3/min	3,360 m^3/min
Power Supply (1-Phase)	220V / 110V	220V / 110V	220V / 110V	220V / 110V
Rated Input Current	0.5 A / 0.9 A	0.6 A / 1.0 A	0.9 A / 1.6 A	1.2 A / 2.5 A
Rated Output Current	0.7 A	0.9 A	1.0 A	1.3 A
Noise Level	< 36 dB	< 36 dB	< 36 dB	< 36 dB
Wind Coverage	Ø6 – Ø9 m	Ø8 – Ø11 m	Ø10 – Ø13 m	Ø12 – Ø15 m

Specifications are subject to change according to model configuration and project-specific requirements; the final standard is determined by the unit actually delivered. Hamilton Air reserves the right to modify or optimize product configurations without prior notice as part of continuous performance improvement. For the latest technical data, consult Hamilton Air's engineering team or official documentation.

4. Package Contents & Main Components

4.1 Fan Blade Package



Single-unit fan blade package as shipped

Component	Unit	Quantity
Aluminium-magnesium airfoil with winglet	pcs	**6**
Extension tube	pcs	**1**
SS304 safety wire, and motor / LED wire (routed inside the tube)	unit	**2**
Security kit for extension tube > 0.5 m	pack	**1**

4.2 PMSM Drive System Package



PMSM motor and mounting hardware package

Component	Unit	Quantity
PMSM motor	pcs	**1**
Fan blade holder (pre-installed to the fan)	pcs	**6**
Mounting bracket	pcs	**1**
Screws & bolts pack (one for motor, one for blades)	packs	**2**
Inverter	pcs	**1**
Handheld remote control	pcs	**1**

Decorative covers	pcs	**2**
Safety chains	pcs	**6**

4.3 Main Component Reference

The exploded view below identifies each structural component in installation sequence, from the ceiling-side bracket down to the motor and fan blades.

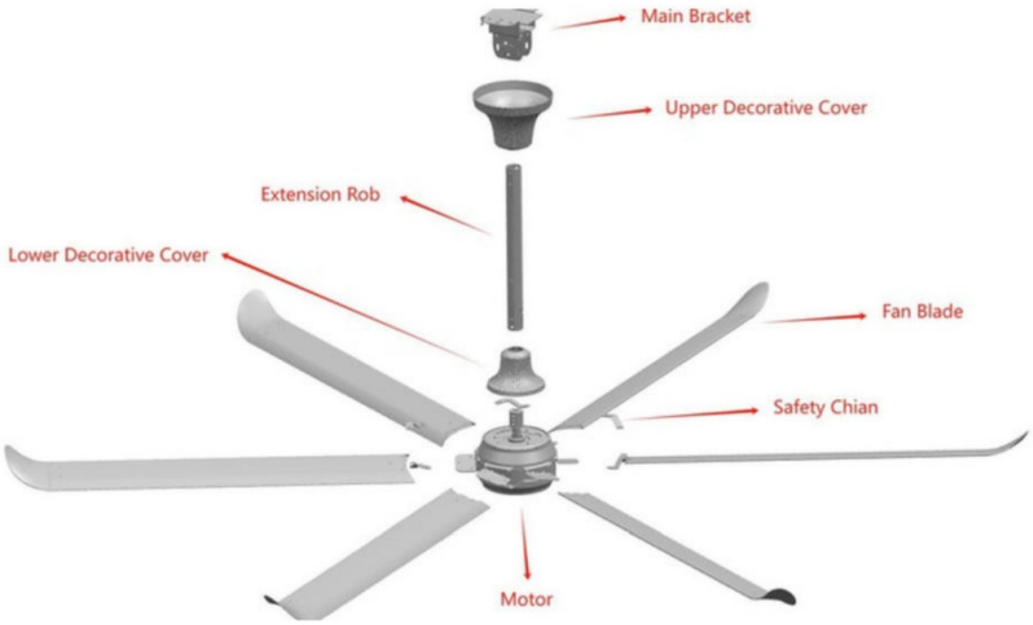


Fig. — PMSM HVLS fan structure, exploded view



Main Bracket · Extension Rod · PMSM Drive System



Fan Blades · Decorative Cover · Safety Chain

Lampshade Cover **Remote Controller** **Inverter**



Lampshade Cover (optional LED) · Remote Controller · Inverter

5. Mounting Structure Options

The Pandora V150e upper mounting bracket accommodates four structural interface types, selected according to the building's ceiling or beam construction. Hamilton Air's engineering team can confirm the correct mounting type and anchor specification for your structure prior to installation.

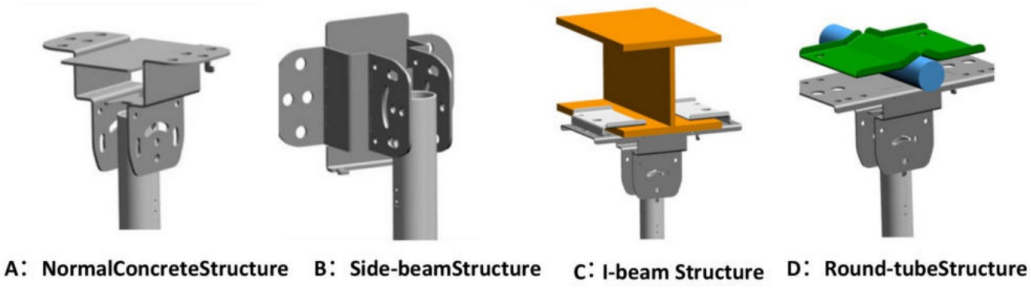


Fig. — Mounting structure options A–D

- **A. Normal Concrete Structure —** Direct anchoring into a solid concrete ceiling using expansion bolts.
- **B. Side-Beam Structure —** Bracket clamps to the side face of a structural crossbeam.
- **C. I-Beam Structure —** Bracket clamps directly to the flange of a steel I-beam.
- **D. Round-Tube Structure —** Bracket saddles over a round structural tube or purlin.

6. Pre-Installation Safety

6.1 Working at Height

- Ceiling fan installation involves working at height. Only trained, authorized professionals should carry out installation.
- Installers must wear safety helmets and safety harnesses at all times, and follow all applicable fall-protection procedures.
- Apply thread-locking adhesive to every screw to ensure secure, vibration-resistant fastening.
- Confirm there are no obstructions near the installation site that could interfere with the fan's rotation before beginning work.

6.2 Selecting an Aerial Work Platform

- Choose a stable, code-compliant aerial work platform (scissor lift or scaffolding) with sufficient reach for the installation height.
- Set up the platform on a level, solid surface and fully secure it before use.
- Confirm the platform is fitted with guardrails and fall-protection features.
- Only trained, authorized personnel should operate the aerial work platform.

7. Step-by-Step Installation Procedure

The following procedure applies to the Pandora V150e fitted with a standard extension rod. Complete each step in full, and re-verify torque and alignment before proceeding to the next.

Step 1 — Mount the Upper Bracket

Normal structure / Side-beam structure

1. Drill mounting holes in the ceiling or on the side of the crossbeam, matching the bolt pattern of the upper mount. Use a Ø12 mm drill bit to a depth of 60–70 mm.
2. Fix 2 to 4 expansion bolts (M10×80) per side, then secure the upper mount with nuts. (Figure 1.1)

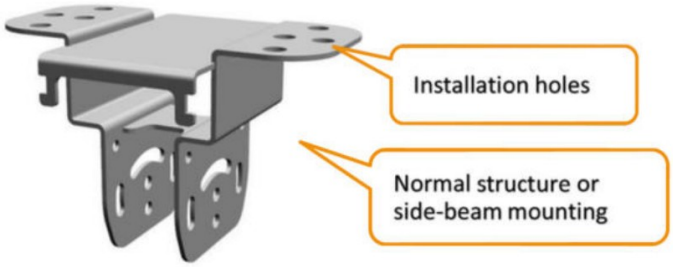
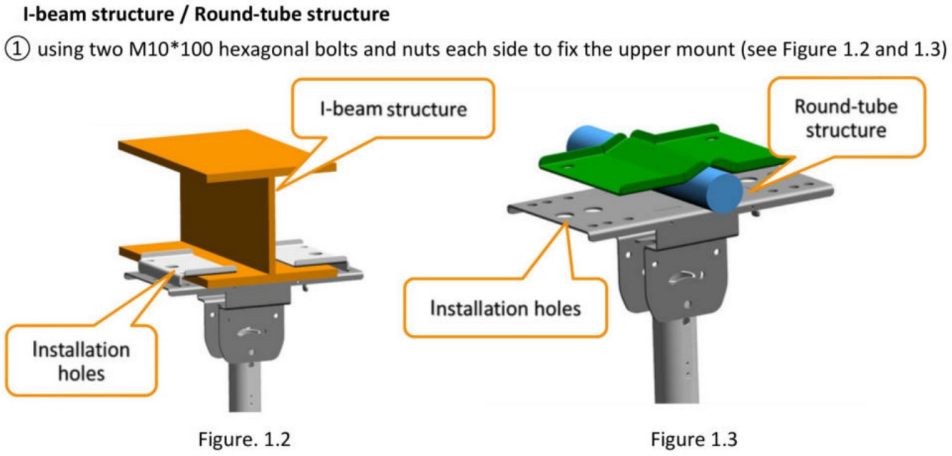


Figure 1.1 — Normal / side-beam mounting

I-beam structure / Round-tube structure

1. Use two M10×100 hexagon bolts and nuts per side to fix the upper mount directly to the beam or tube. (Figures 1.2 & 1.3)



Figures 1.2 / 1.3 — I-beam and round-tube mounting

Step 2 — Install the Controller

1. Insert the controller into the hollow frame of the upper mount. Route the power cord, motor wire, and (optional) LED wire out through the designated end. (Figure 2)
2. Secure the controller and wiring to the upper mount with a zip tie seated in the positioning groove, to prevent it loosening in operation.

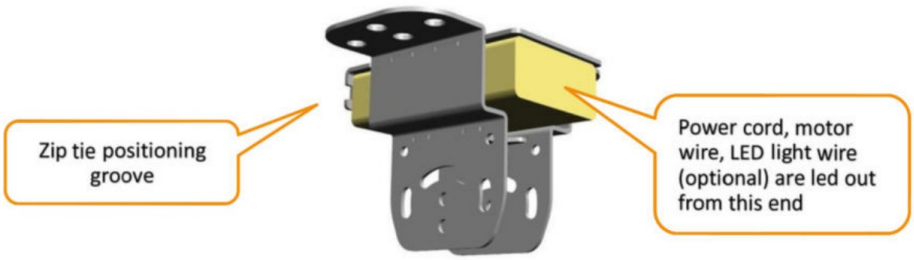


Figure 2 — Controller seated in the upper mount

Step 3 — Assemble the Extension Tube

1. Identify the tube's upper and lower ends — the end with the open slot is the lower end. (Figure 3.1)

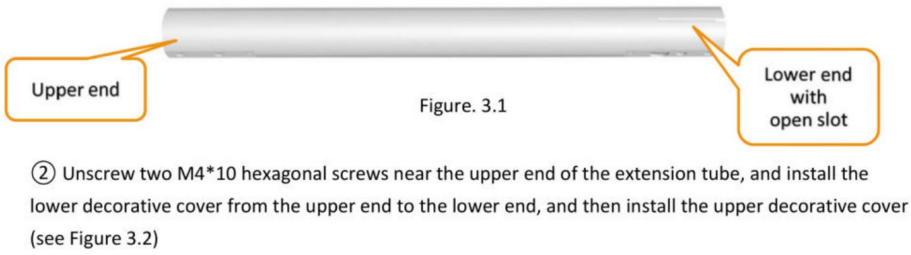
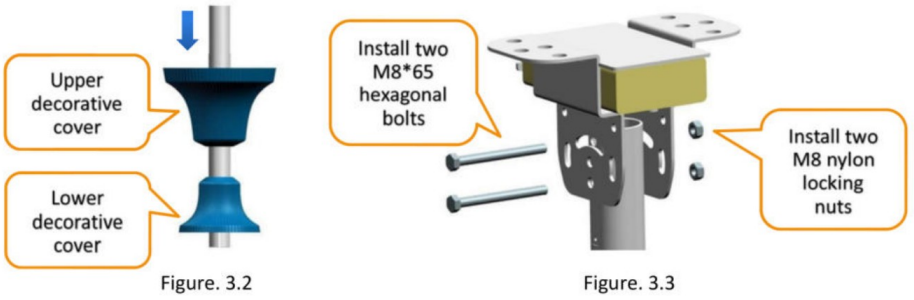


Figure 3.1 — Extension tube orientation

2. Remove the two M4×10 screws near the upper end; thread the lower decorative cover onto the tube from the upper end toward the lower end, then thread on the upper decorative cover. (Figure 3.2)

3. Insert the tube's upper end into the upper mount, align the bolt holes, and secure with two M8×65 hexagon bolts, flat washers, spring washers, and M8 nylon locking nuts — keeping the tube perpendicular to the mount. (Figure 3.3)



Figures 3.2 / 3.3 — Decorative covers and tube-to-mount fixing

4. Connect the safety rope: pass an M6×65 hexagon screw through the holes beneath the controller frame and through the upper terminal of the SS304 wire rope extending from the tube; secure with a flat washer, spring washer, and M6 nylon locking nut. (Figure 3.4)

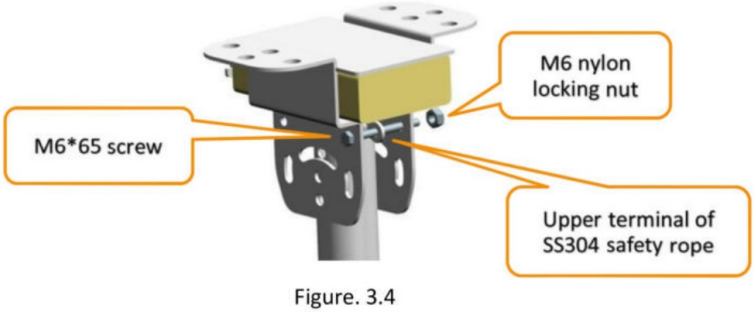
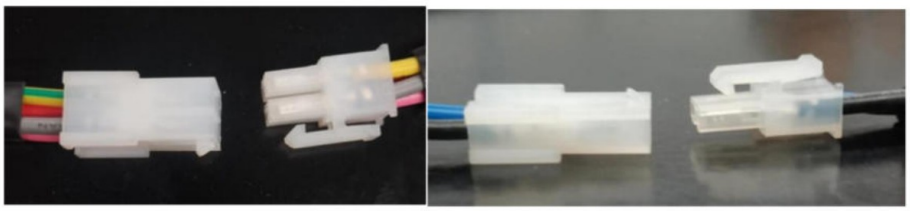


Figure 3.4 — Safety rope, upper terminal

5. Connect the 4-core motor wire and, if fitted, the 2-core LED wire between the controller and the extension tube, engaging each plastic connector fully. Confirm the safety buckles on the male and female plugs align correctly. (Figures 3.5 & 3.6)



Figures 3.5 / 3.6 — Motor and LED wire connectors

6. With the power supply switched OFF, connect the 220 V power cord. Only energize the unit once installation is complete and the site is confirmed safe.

7. Slide the upper decorative cover up over the mount and secure it with two M4×10 screws, flat washers, and spring washers on the extension tube, to prevent it sliding down. (Figures 3.7 & 3.8)

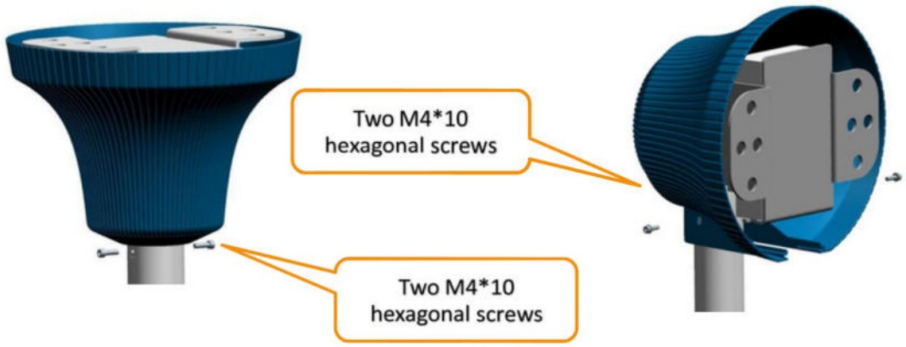


Figure. 3.7 Figure 3.8

Figures 3.7 / 3.8 — Upper decorative cover, fitted

Step 4 — Install the Motor

1. Insert the motor into the extension tube, align the bolt holes, and secure with two M8×65 hexagon bolts, flat washers, spring washers, and M8 nylon locking nuts. (Figure 4.1)

hexagonal bolts, flat washers, spring washers, and M8 nylon locking nuts to tighten the structure (see Figure 4.1)



Figure 4.1 — Motor-to-tube fixing

2. Connect the 4-core motor wire and, if fitted, the 2-core LED wire between the motor and the extension tube.

3. Connect the safety rope's lower terminal to the motor shaft using an M6×20 hexagon screw, flat washer, and spring washer. (Figure 4.2)

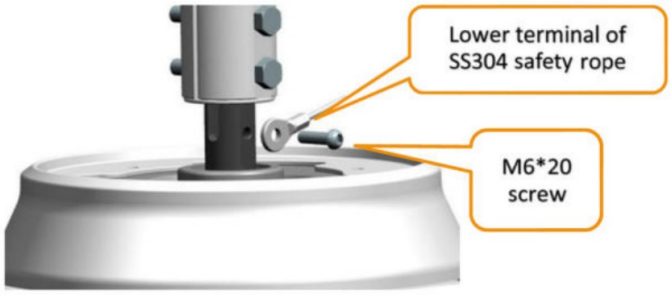


Figure 4.2 — Safety rope, lower terminal

4. Slide the lower decorative cover down over the motor shaft connection. Two pre-installed M4×10 screws on the extension tube prevent it sliding down. Leave the specified gap between the cover and the motor housing. (Figure 4.3)

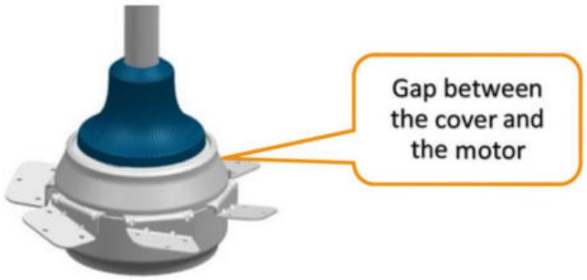


Figure 4.3 — Lower decorative cover, fitted

Step 5 — Install Fan Blades & Safety Chain

1. Remove the black protective plug from the front end of each fan blade. Insert the blade into the blade holder on the motor, align the bolt holes, and secure the blade and safety chain together using three M6×20 hexagon bolts, flat washers, spring washers, and M6 nylon locking nuts. Screw heads must face downward. (Figure 5.1)

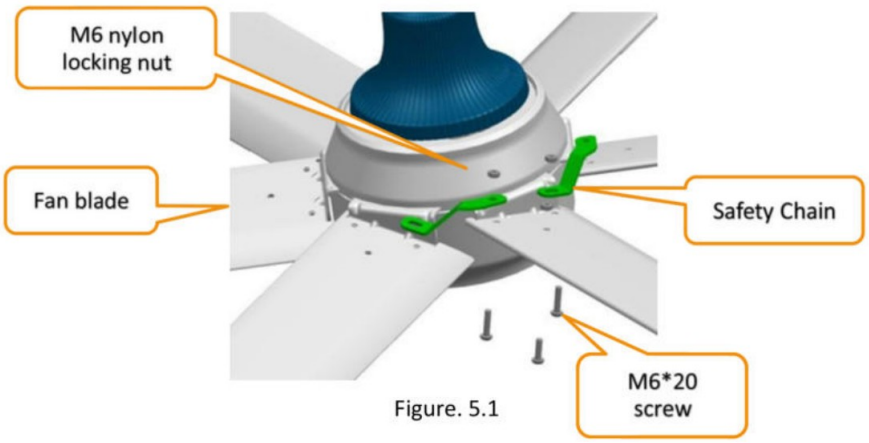


Figure 5.1 — Blade and safety-chain fixing

2. Install all remaining blades symmetrically, following the same procedure, to keep the rotor balanced.

Step 6 — Final Inspection

After all blades are installed, verify the following before commissioning:

1. Fan level — use a spirit level to check the extension tube and blades; correct any tilt before proceeding.
2. Clearance — confirm the distance between the fan blades and any obstacle exceeds 0.3 m, and the distance from the blades to the finished floor exceeds 2.5 m. Adjust if these minimums are not met. (Figure 6.1)

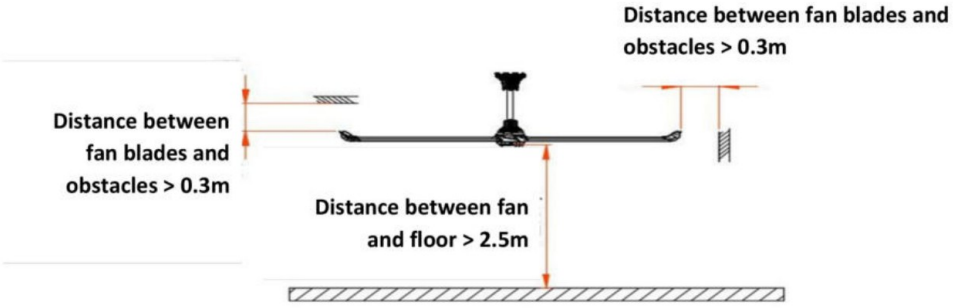


Figure 6.1 — Required clearance envelope

8. Electrical Wiring Diagram

The inverter (controller) interfaces the incoming AC220V supply, the PMSM motor, and the optional lighting circuit as shown below.

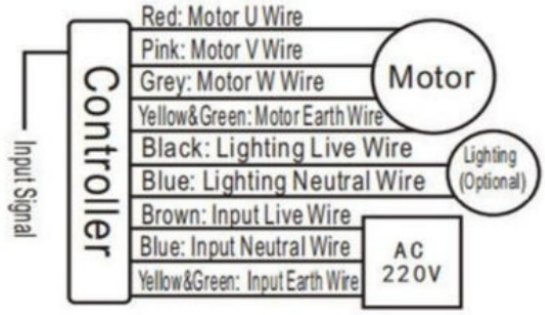


Fig. — Controller wiring diagram

Electrical Safety

- Wiring must be performed only by a qualified electrician, in accordance with local electrical codes.
- Confirm the circuit is de-energized and locked out before connecting or servicing any wiring.
- Motor and input earth (yellow & green) conductors must be correctly grounded before the unit is energized.

9. Operating the Fan

9.1 Handheld Remote Control

Power on the fan under safe conditions. Once the controller emits a long confirmation beep, the remote is ready for use.

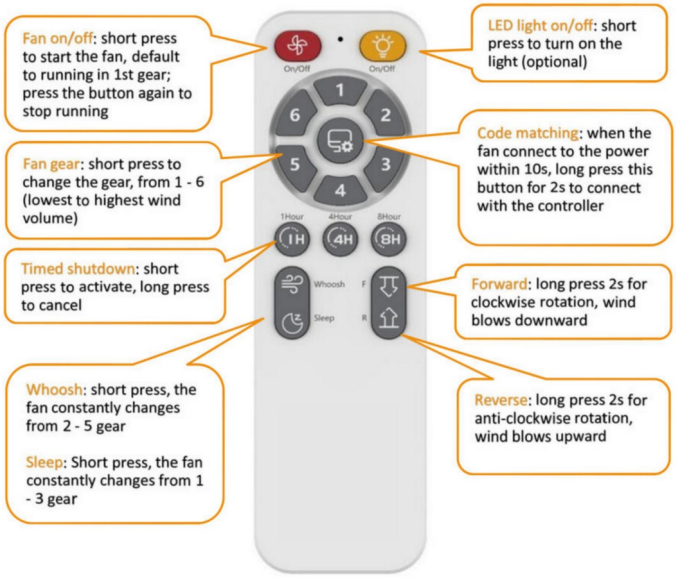


Fig. — Handheld remote control layout

- **Fan On/Off —** Short press to start (defaults to Gear 1); press again to stop.
- **Fan Gear —** Short press to cycle speed from Gear 1 (lowest) to Gear 6 (highest).
- **LED Light On/Off —** Short press to toggle lighting (optional accessory).
- **Code Matching —** Within 10 seconds of powering on, long-press for 2 seconds to pair the remote with the controller.
- **Timed Shutdown —** Short press to activate a 1 / 4 / 8-hour countdown; long-press to cancel.
- **Whoosh Mode —** Short press — fan cycles continuously through Gears 2–5 for natural airflow variation.
- **Sleep Mode —** Short press — fan cycles continuously through Gears 1–3 for quieter night-time operation.
- **Forward —** Long-press 2 seconds for clockwise rotation (wind directed downward).
- **Reverse —** Long-press 2 seconds for counter-clockwise rotation (wind directed upward — useful for winter destratification).

9.2 Wireless Touch Controller (optional upgrade)

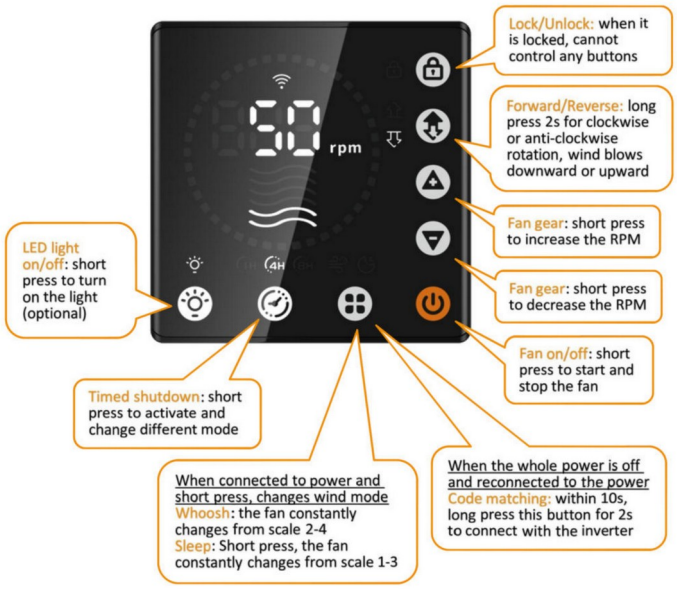


Fig. — Wireless touch controller layout

- **Fan On/Off —** Short press the power icon to start or stop the fan.
- **Fan Gear ▲ / ▼ —** Short press to increase or decrease RPM.
- **Forward/Reverse —** Long-press 2 seconds to reverse rotation direction.
- **Lock/Unlock —** Locks the panel to prevent accidental input.
- **LED Light On/Off —** Short press to toggle lighting (optional accessory).
- **Wind Mode —** Short press to cycle Whoosh (Gears 2–4) or Sleep (Gears 1–3) modes.
- **Timed Shutdown —** Short press to activate and cycle timer duration.
- **Code Matching —** After a full power cycle, long-press for 2 seconds within 10 seconds of reconnecting power to pair with the inverter.

10. Installing the Safety Wire Ropes

Mandatory whenever the extension rod exceeds 100 cm in length (see Section 1, Operating Conditions). Hardware required: 2 mm wire rope, wire-rope spring hooks, M6 turnbuckles, M6 nylon anti-loosening nuts, M6×65 hexagon socket head cap screws (grade 12.9), M6 spring washers, and M6 flat washers.

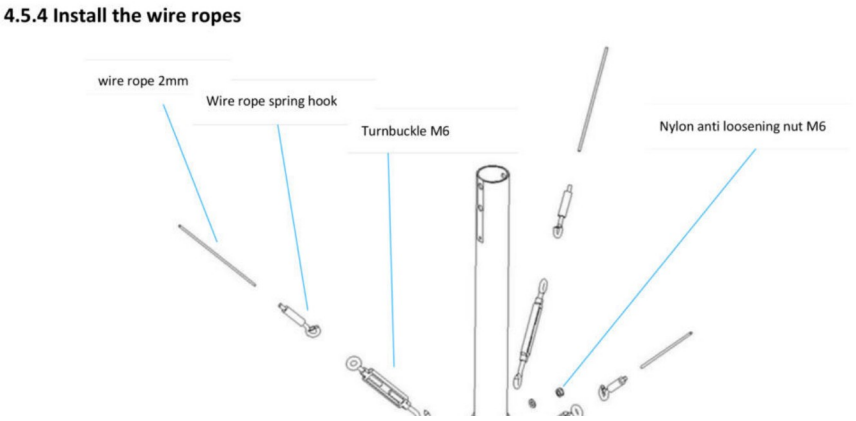


Fig. — Wire rope hardware set

Installation Geometry

- Anchor four wire ropes from the diagonal hook points near the top of the extension rod to four points on the surrounding structure.
- The two ropes on one diagonal must be anchored at the same level; the other two ropes, on the perpendicular diagonal, must be anchored at a matching, common level.
- The anchor points' diagonal lines must be perpendicular to each other — the angle between adjacent wire ropes should be 90°.

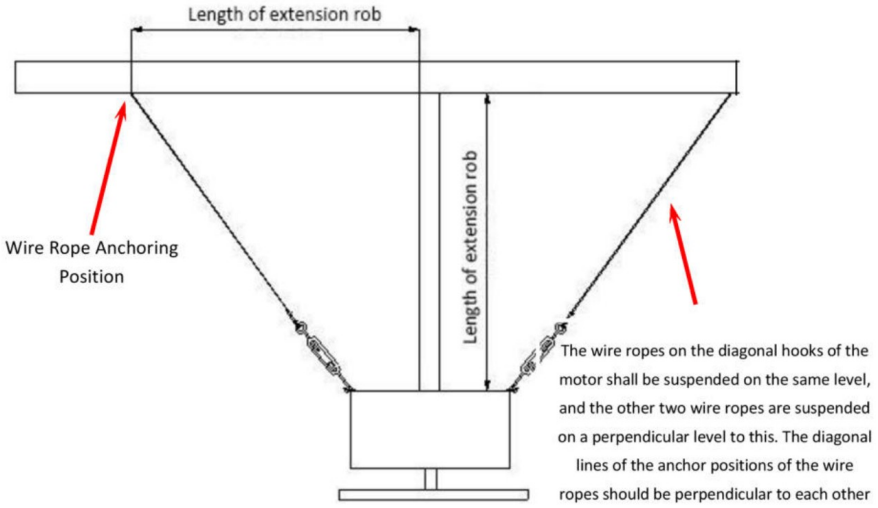


Fig. — Wire rope anchoring geometry

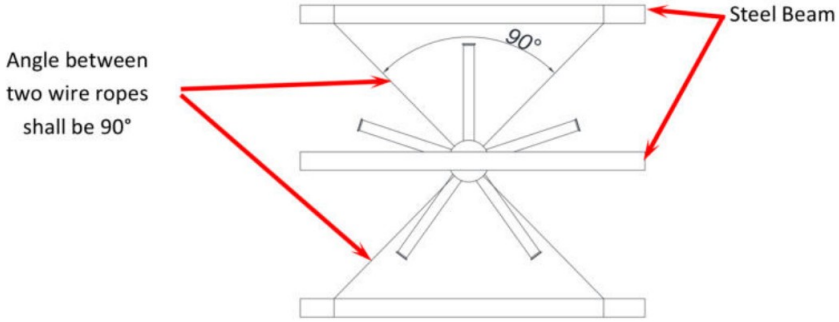


Fig. — 90° anchoring angle between wire ropes

Clearing Obstacles Around the Fan

- Before commissioning, inspect the full rotation radius for obstacles. Rotate the fan slowly by hand and observe for anything the blades could contact while the fan sways in operation.
- Obstructions such as pendant light fixtures should be shortened or relocated as needed to maintain clearance.

11. Troubleshooting Guide

If the inverter (VFD) displays an abnormal condition during operation, refer to the likely causes and corrective actions below.

No.	Abnormal Condition	Possible Cause(s)	Recommended Solution(s)
1	**No display on buttons after power-on**	• VFD input power not available. • Wiring between buttons and control board defective. • Internal VFD defect.	• Check the input power supply. • Replace the cabling between the buttons and control board. • Contact Hamilton Air technical support.
2	**PMSM drive system does not rotate**	• Mechanical blockage in the drive system. • Anti-reverse setting inconsistent with running direction. • Frequency reference signal at zero. • Missing phase in drive system wiring.	• Check for mechanical obstruction; replace the drive system if defective. • Reverse or correct the rotation-direction setting. • Check the frequency reference signal. • Inspect the drive system wiring.
3	**PMSM drive system rotates in reverse**	• Incorrect phase sequence in drive system wiring.	• Correct the phase sequence of the motor wiring.
4	**PMSM drive system vibrates noticeably**	• Mechanical vibration. • Motor anchoring not stable. • Unstable power supply.	• Adjust the affected mechanical parts. • Tighten and adjust the anchoring hardware. • Check the power input load.
5	**PMSM drive system produces obvious noise**	• Bearing wear or poor lubrication. • Low carrier frequency.	• Replace the drive system. • Increase the carrier frequency.

12. Maintenance & Care

12.1 Maintenance Cautions

- Always de-energize the control panel and keep the circuit breaker OFF before servicing.
- Clean the dust screen at the air intake and exhaust at regular intervals.
- Never immerse the control panel or PMSM drive system in water for cleaning.
- Clean the control panel and fan blades with a soft cotton cloth and a non-solvent cleaning agent only. Do not use gasoline, air fresheners, decontamination powder, or alkaline detergents.
- If the fan will be out of service for an extended period, switch off the leakage-protection switch in the control panel.

12.2 Daily Checking & Maintenance Schedule

Checking Point	Content	Method	Reference Standard
Operation Circumstances	Temperature	Infra-red sensor	-10℃ to 40℃
	Humidity	Humidometer	5% – 95%, condensation not allowed
	Dust, dirt, water or leakage	Visual inspection	No dust, oil dirt, water, or leakage
	Vibration	Observation	Stable operation, no abnormal vibration
	Fluid	Smell and visual inspection	No distinct odors or smoke
VFD (Variable Frequency Driver)	Noise	Listening	No distinct noise
	Fluid	Smell and visual inspection	No distinct odors or smoke
	Appearance	Visual inspection	No defects or deformation
	Heating & dissipation	Visual inspection	No dirt or lint blocking the air exhaust; fan runs with correct air velocity and volume; no distinct heating
PMSM Drive System	Heating	Sensor	No distinct heating or smell of burning
	Noise	Listening	No distinct noise
	Vibration	Observation and listening	No distinct vibration or noise
Operation Parameters	Input current	Ammeter	Within specification
	Input voltage	Voltmeter	Within specification
	VFD output current	Ammeter	Within specification
	VFD output voltage	Voltmeter	Within specification

This guide reflects Hamilton Air's standard installation procedure for the Pandora V150e Series. For project-specific engineering support — structural load verification, custom mounting brackets, or multi-unit layout design — contact Hamilton Air's technical team.