# Q-PAC

## MULTIMOTOR PLENUM FAN

# PRODUCT HANDBOOK

# ABOUT Q-PAC

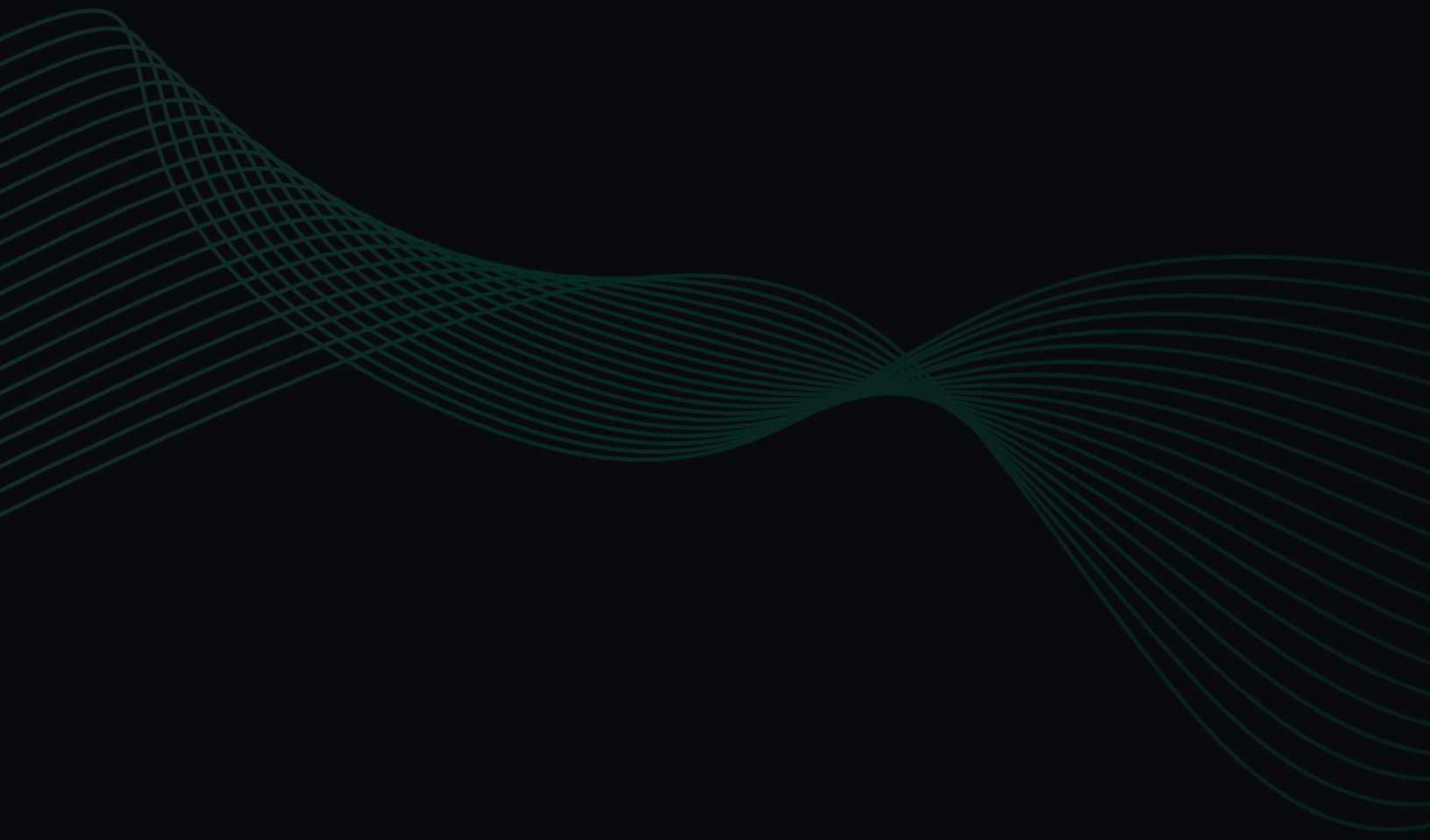
Q-PAC builds smarter fans for commercial air handlers. These fans reduce complexity, simplify operation, and help teams keep systems running without the usual chaos.

We believe moving air should be simple. That's why we challenge outdated tech and over-complicated processes through engineering that's relentlessly practical and performance-driven. Our team blends deep field experience with new ideas, all working toward one goal: move air better, faster, and with less friction.

Guided by four values—curiosity, relentlessness, agility, and passion—we've built more than a product line. We've built a team culture focused on solving real-world problems and evolving the industry along the way.

We're Great Place to Work-Certified™ and proud of the way we work. We believe in open conversations, shared goals, and a focus on building products and relationships that last.


DESIGNED TO WORK. BUILT TO LAST. BACKED BY PEOPLE WHO CARE.



# INDEX

# A NEW FAN ARCHITECTURE: THE MULTIMOTOR PLENUM FAN

## A NEW TYPE OF FAN—BUILT TO SIMPLIFY, NOT COMPLICATE

The goal of comfort cooling is simple: maintain a livable, reliable environment. The reality? Fans fail, and often at the worst time. Fan arrays were designed to spread that risk, but they introduced their own complications: more wiring, more controls, more headaches. The Multimotor Plenum Fan (MPF) is a new fan design that closes that gap, combining the simplicity of a single blower with the resiliency of a fan array, minus the complexity. It delivers dependable performance while streamlining everything from order to installation to operation.

### SINGLE DEVICE

One of the key advantages of single-motor fans is simplicity: one power run, one control point, one BMS connection. Fan arrays, by contrast, often need a proprietary external panel just to coordinate power and controls. The Multimotor Plenum Fan (MPF) keeps that simplicity without the limitations. Its control architecture is built in, not bolted on, allowing direct integration with the BMS or your preferred control device. No external panel required.

### RESILIENCY

The downside of single-motor fans is that when one fails, airflow stops. There's no backup. Fan arrays solve this with built-in redundancy, keeping air moving even if a motor goes down. The Multimotor Plenum Fan (MPF) delivers that same resiliency: if one motor fails, others compensate to maintain airflow. Resiliency means continuous operation without disruption.

### UNISON OPERATION

With the MPF, each motor runs individually, but all respond to a single control signal. That means consistent, coordinated operation from a single device. Fan arrays aim for the same result but often require an external control panel to get there. The MPF builds that intelligence in, not around.

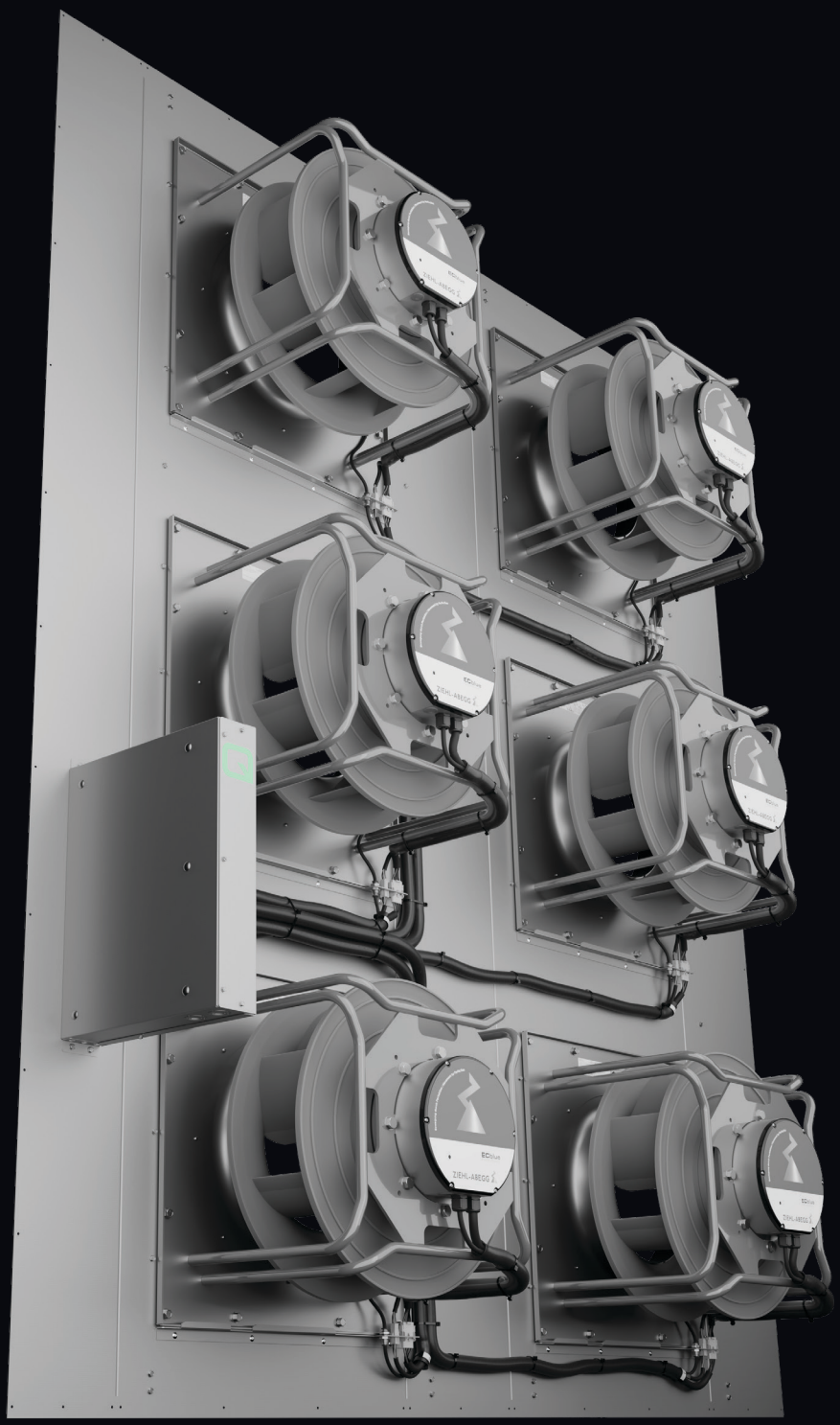
### VERIFIED PERFORMANCE

Single-motor fans offer proven, tested performance. Fan arrays often rely on extrapolated data from a single fan, making system performance harder to predict, especially after a failure. The MPF eliminates that uncertainty with a verified performance curve, tested as a complete assembly rather than a sum of parts.

“New” doesn’t have to mean complicated. The Multimotor Plenum Fan (MPF) is not a product line—it’s a new category of commercial HVAC fan. Unlike traditional single-motor blowers or fan arrays, the MPF combines their strengths while eliminating their tradeoffs. It offers the simplicity of a single blower, the built-in resiliency of a fan array, and the clarity of unified control and installation. The tables below compare the Multimotor Plenum Fan (MPF) to traditional fan technologies, highlighting where complexity is reduced, not added.

| | SINGLE-MOTOR FANS | FAN ARRAY | MPF |
|---|---|---|---|
| **SINGLE DEVICE** | The motor, often paired with a VFD, acts as the single point of power and control. These fans are typically delivered as a single assembly, not in knockdown form, limiting installation flexibility. | Functions as a single device only with a proprietary control panel. Often requires individual motor wiring and on-site setup. Adds complexity compared to integrated solutions. | A single connection point, located directly on the fan, handles both power and control. Motors come pre-wired to simplify installation. Available as a single assembly for fast installation. |
| **SPEED MODULATION** | Typically rely on VFDs for speed control or operate at a fixed speed. | Require an external VFD or proprietary panel, depending on whether AC or EC motors are used. | Uses EC motors and accepts a direct speed control signal—no external controller needed. |
| **RESILIENCY** | One motor and impeller means a failure stops airflow. Avoiding downtime typically requires a full redundant unit, often doubling system cost. | Divides airflow across multiple fans, coordinated by a proprietary control panel. Maintains airflow even if one fan fails. | Shares airflow across multiple motors to maintain performance during a motor failure; no added equipment needed. |
| **REPAIR AND REPLACEMENT** | Known for long lifespan but often require skilled labor or machining to repair. Large size makes replacement difficult, especially in tight or critical spaces. | Modular design supports replacement but often involves disassembly and technical expertise to service motors or impellers. | Built for easy motor replacement with minimal tools or downtime. Modular layout and knockdown option make it well-suited for tight or retrofit spaces. |

# Q-PAC'S MULTIMOTOR PLENUM FAN



SMART FAN TECHNOLOGY

ADAPTIVE FRAME

KNOCKDOWN & ASSEMBLED

AUTOMATED DESIGN

The Q-PAC Multimotor Plenum Fan—what we call the Q-PAC Fan—represents our implementation of the multimotor plenum fan category and a clear departure from traditional fan arrays. It's not just a new fan, but a smarter, leaner approach to air movement in commercial HVAC systems.

By expanding the Fan Controller's capabilities to support both analog signals and standard communication protocols, the Q-PAC Fan functions as a true standalone device. It's simple to install, easy to operate, and built for compatibility across a wide range of systems.

It delivers all the foundational benefits of the MPF category—then pushes further, reducing complexity at every stage from installation to long-term operation.

The Fan Controller is more than a power distributor; it's the brain of the Q-PAC Fan. It communicates directly with each motor, monitoring status, calculating airflow per impeller, and managing alarms in real time. Alongside basic analog connections for power and controls, it also supports Modbus communication, with more integrations in development.

Many fan arrays rely on standard-sized cubes or fixed frames, which means field fabrication to close gaps and finish the bulkhead wall. The Q-PAC Fan skips that step. Custom-fit sheet metal panels form a complete bulkhead wallno cutting, no patching, no surprises. It mounts directly to an existing flange when available, or uses the included Perimeter Angles as a fast, reliable adapter.

While the Q-PAC Fan is often installed in new air handlers, Q-PAC has supported field retrofits for nearly a decade. Built with interlocking panels and features that speed up assembly, the fan can ship knockdown as palletized components with user-friendly guides. Or, for faster installs, it's available fully assembled with no tools, no hassle, and no extra steps.

Q-PAC Fans are designed in seconds, not hours or days. Our parametric design engine instantly selects the right motors and builds the matching fan frame for your specifications. Just enter your airflow, dimensions, and power supply, and get back a tailored fan with exact performance data—no guessing, no settling for a "close enough" blower from a limited catalog.

## PLUG FANS | p22

### INTERCHANGEABLE

Q-PAC's motor harness standardizes connections across all plug fans of the same model with no addressing required. That means fans can be installed in any position on the Q-PAC Fan or swapped into other systems using the same motor.

### ECM TECHNOLOGY

The Q-PAC Fan uses electrically commutated motors, so there's no need for VFDs, simplifying controls and boosting efficiency. Some models even help mitigate power harmonics, reducing strain on your electrical system.

### PRE-WIRED MOTORS

Motors are factory-wired with a dedicated power and control harness that plugs directly into the Frame Harness, connecting back to the Fan Controller. There's no field wiring, no addressing, just a clean, plug-and-play setup.


## FAN CONTROLLER | p16

### SINGLE POINT

The Fan Controller is the single connection point for power and controls. Motors arrive pre-wired and connect with plug-and-play harnesses—no field wiring, no setup steps, just plug in and power up.

### STANDARD COMMUNICATION

Q-PAC Control Panels offer the simplest path to integration, but they're not required. The Fan Controller supports direct connections via analog or Modbus, giving you full control without needing a panel.

### MOTOR PROTECTION

The Fan Controller includes built-in branch circuit protection, sized for the connected EC motors (Class CC 15A or 20A).

## FAN FRAME | p12

### ADAPTIVE DESIGN

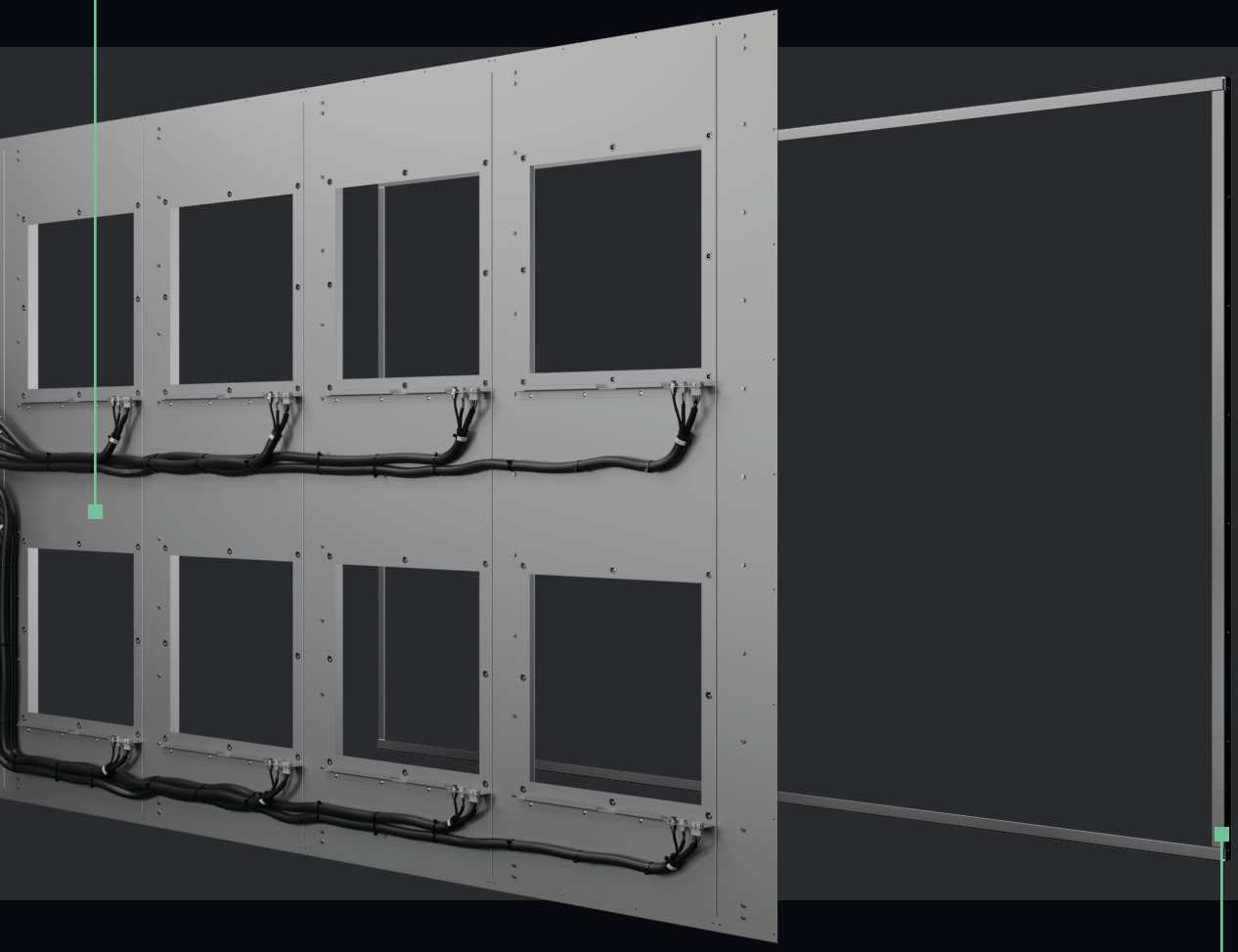
Designed to order, the Q-PAC Fan Frame matches cabinet dimensions. Each Q-PAC Fan can scale up to 150 inches wide and 140 inches tall.

### PRESSURE WALL

With the Q-PAC Fan covering the entire span of the air handler, there is no need for field fabrication to cover gaps. The Q-PAC Fan Frame is designed for operating pressures up to 9 inWc.

### RAPID ASSEMBLY

From interlocking panels to built-in ledges, rivet nuts, and plug-and-play harnesses, the Q-PAC Fan is built for fast assembly and easy maintenance. There's no specialty tools or expertise required.



## PERIMETER ANGLES | p41

### AIR HANDLER ADAPTERS

The Q-PAC Fan mounts directly to a flanged surface inside the air handler. If there's no flange, the Perimeter Angle provides a clean, ready-to-mount adapter. There's no custom framing required.

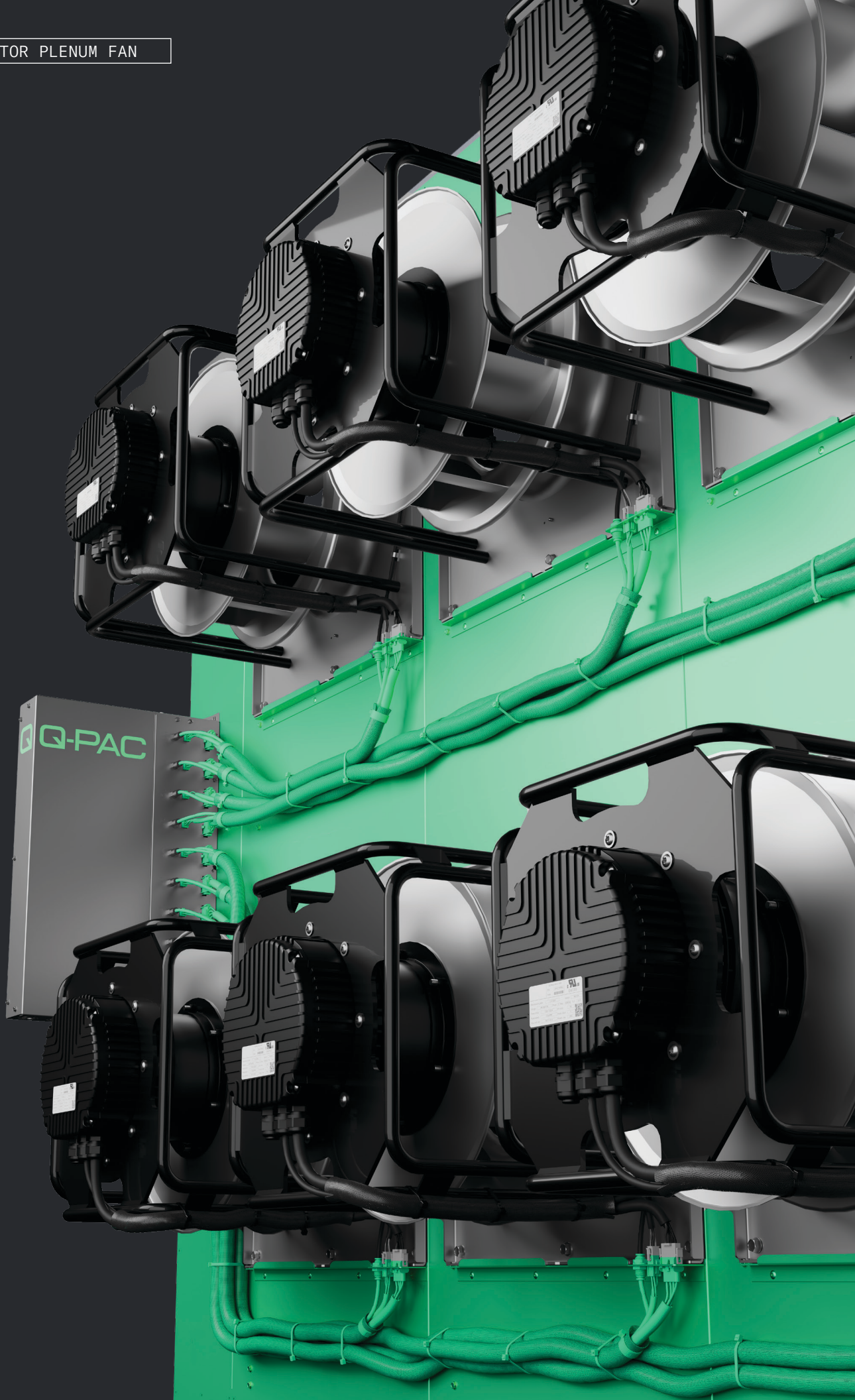
### CUSTOM FIT

Not all air handler walls are perfectly straight and that's okay. Perimeter Angles are designed to absorb up to 1/2" of dimensional variance. This makes fan installation worry-free, even in older or field-modified units.

### VERSATILE INSTALLATIONS

Perimeter Angles enable installation anywhere in the air handler, ensuring optimized performance and maintenance space.

001 | THE MULTIMOTOR PLENUM FAN



# FAN FRAME

## BUILT-IN STRENGTH. BUILT-IN SIMPLICITY.

It provides a stable mounting surface for the Fan Controller and motorized impellers. It routes and supports the power, control, and pressure connections between them. And it doubles as the plenum's pressure wall, integrating structural and functional roles in one component.

The fan frame includes:

- Interlocking sheet metal panels with:
  - Structural channels
  - Plug fan mounting ledges
  - Rivet nuts for plug fan mounting
- Frame harnesses

## ADAPTABILITY STARTS WITH THE FRAME.

The Q-PAC Fan Frame isn't just designed; it's programmatically generated. That means its dimensions and cable routing are tailored automatically to the project, with pre-punched harness holes that simplify mounting and speed up install.

Each frame includes a 1-1/4" perimeter flange with a standardized mounting hole pattern, making it easy to fit into any Air Handling Unit, including built-up systems for fan replacement.

In retrofit installs, the panels are labeled and installed left to right in numerical order, following clear, job-ready documentation. Whether it's assembled at the factory or built on-site from a kit, the outcome is the same: consistent, dependable performance every time.

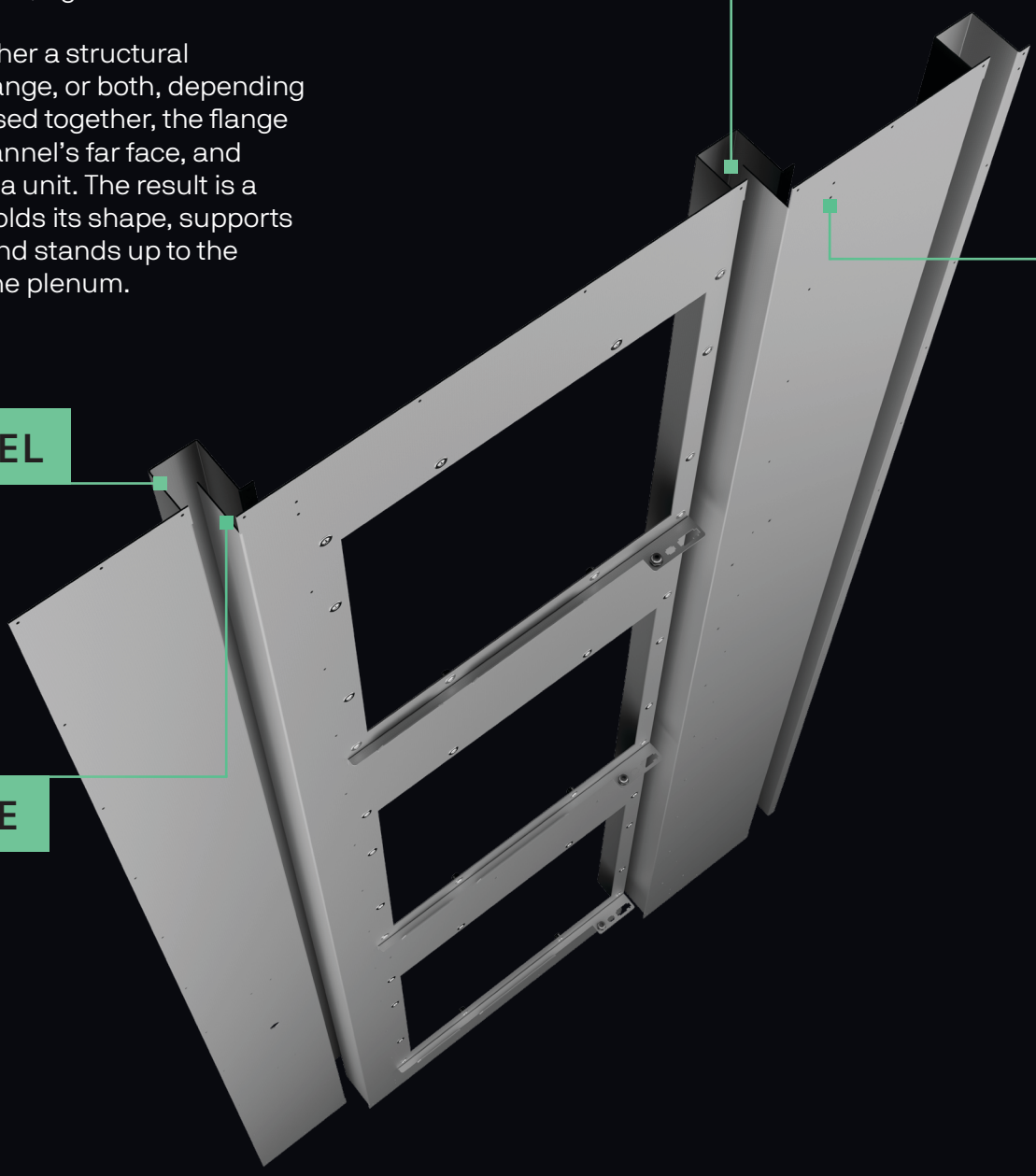
## INTERLOCKING PANELS

The Q-PAC Fan Frame is built from interlocking panels of A653 G90 galvanized steel, fastened together to form a durable, rigid structure.

Each panel includes either a structural C-channel, a bracing flange, or both, depending on placement. Where used together, the flange nests against the C-channel's far face, and the two are fastened as a unit. The result is a reinforced frame that holds its shape, supports internal components, and stands up to the pressure demands of the plenum.

## PANEL CHANNEL

## PANEL FLANGE



# BUILT WITH PURPOSE.
# DESIGNED FOR PRECISION.

## PLUG FAN LEDGES

Every plug fan location includes a sheet metal ledge that supports the plug fan's weight during install. That means one person can often handle fan replacement without extra hands or equipment.

These ledges also include built-in mounts for the Frame Harness plugs, keeping wiring secure and simplifying both initial assembly and future swaps.

## PLUG FAN MOUNTS

Each plug fan secures from the downstream side using factory-installed rivet nuts, giving you a tight, reliable hold without slowing down the install.

## PANEL SCREWS

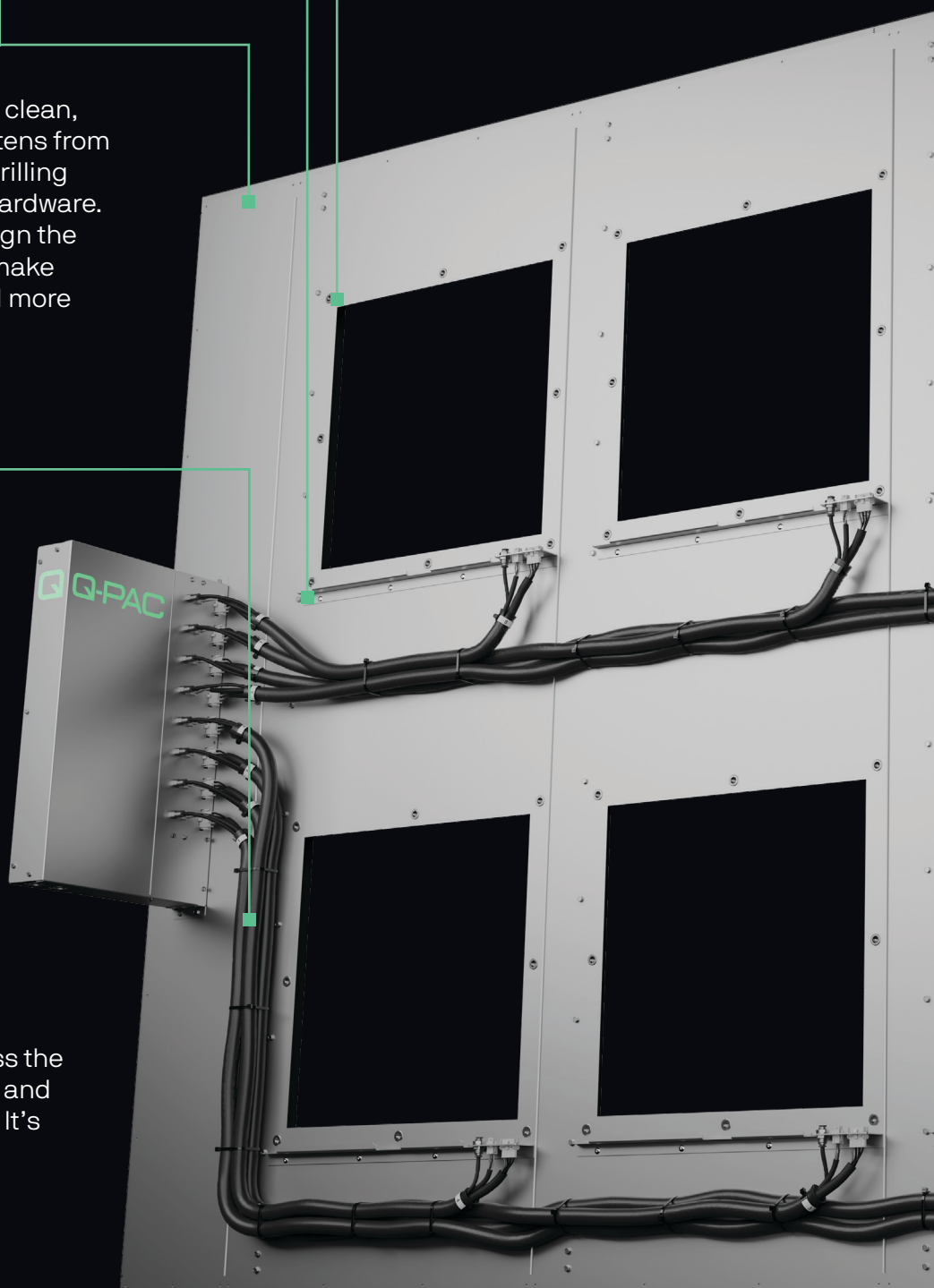
The Q-PAC Fan Frame is designed for clean, one-sided assembly. Every panel fastens from the downstream surface using self-drilling screws with no nuts and no hidden hardware. Pre-punched holes on each panel align the C-channel and perimeter screws to make the build process faster, simpler, and more consistent in the field.

## FRAME HARNESSES

Each motor connects to its own dedicated harness, integrated directly into the Fan Frame. This custom Frame Harness includes separate cables for power and control, plus a pressure tube to measure differential pressure across the inlet cone.

The assembly is enclosed in a UL VW-1-compliant sleeve and clearly labeled with its corresponding motor location to eliminate guesswork and reduce errors.

Harness routes follow a consistent, programmatically defined path across the frame, guided by pre-punched holes and secured with push-mount cable ties. It's fast, clean, and field-ready.



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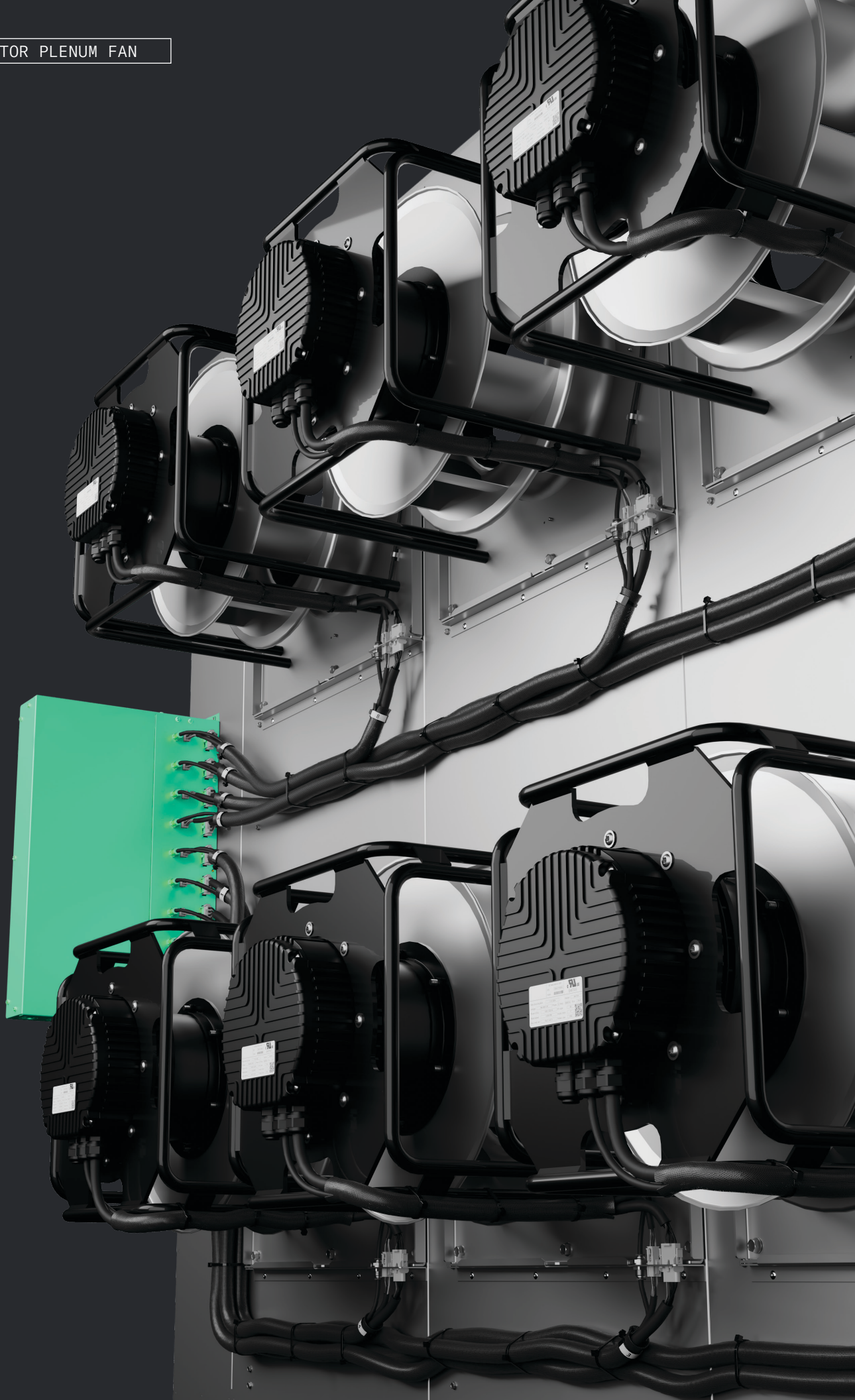


# FAN CONTROLLER

## ONE FAN. ONE CONTROLLER. ONE POINT OF CONNECTION.

The Q-PAC Fan Controller is the patented hub for power and control, serving as the single point of connection for every motor in the system. From just one location, it distributes three-phase power and control signals to each motor through labeled, plug-terminated harnesses.

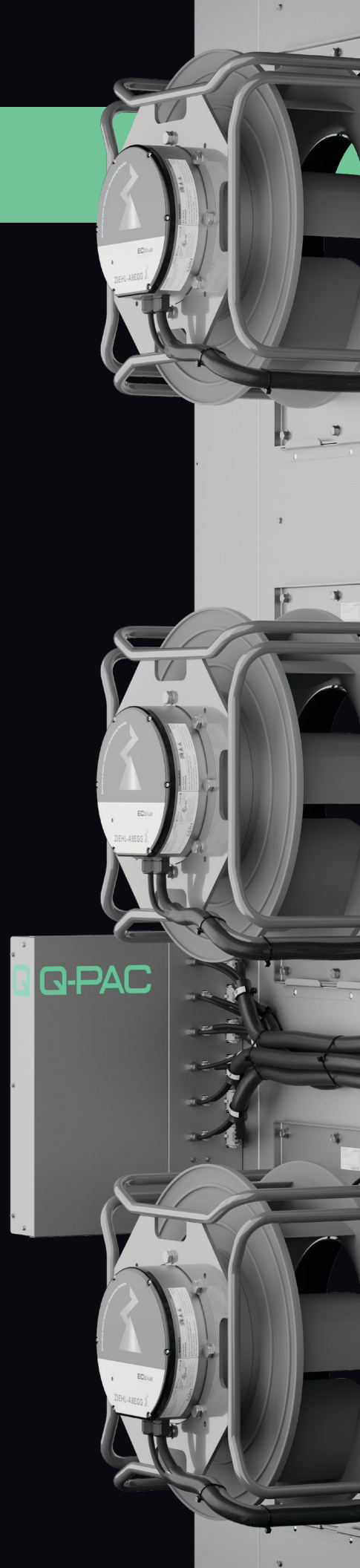
For standard operation, only three connections are required:

- Three-phase power (200–240V or 440–480V, 60Hz)
- Neutral ground
- 0–10VDC analog signal for speed modulation

That's it. No external control panel is needed. For installations without a dedicated panel, NEC 430.102(B) requires a disconnect switch in line. By removing the need for field-wired VFDs and control panels—standard in traditional Fan Arrays—the Q-PAC Fan simplifies integration and trims install time.

## BUILT-IN RESILIENCY. BUILT TO EVOLVE.

If the Fan Controller ever loses its 24V power supply, it's designed to fail gracefully. A normally open relay closes to bypass the controller logic and route the analog speed signal directly to the motors, keeping airflow stable and systems online.
The Controller supports both 0–10V analog control and Modbus RTU, with BACnet IP currently in development. It's UL 60730-2-15 Recognized and engineered for in-place upgrades. Firmware updates can be installed without hardware swaps, and even major improvements require replacing only the Fan Controller, not the entire fan or system.



## FAN CONTROLLER BOARD

The Fan Controller Board is the central logic unit of the Q-PAC Fan. It manages communication through analog and Modbus inputs and provides key feedback like motor alarms, operating status, and airflow. The board connects to all motors and serves as the interface between system controls and the fan.

## HARNESS CONNECTIONS

Each plug fan connects to the Fan Controller through three labeled connection points matching the motor harness and its frame location. These include a power plug, a control plug, and a push-to-connect port for the pressure tube.

## MOTORIZED IMPELLER INTERFACE BOARDS

Every motor is connected to its own dedicated interface board inside the Fan Controller. These PCBs are pre-wired to the Fan Controller Board and include plug-in terminals for motor power, control, and a pressure sensor. The pressure sensor connects through a push-fit port to support airflow monitoring.

## FUSED PROTECTION

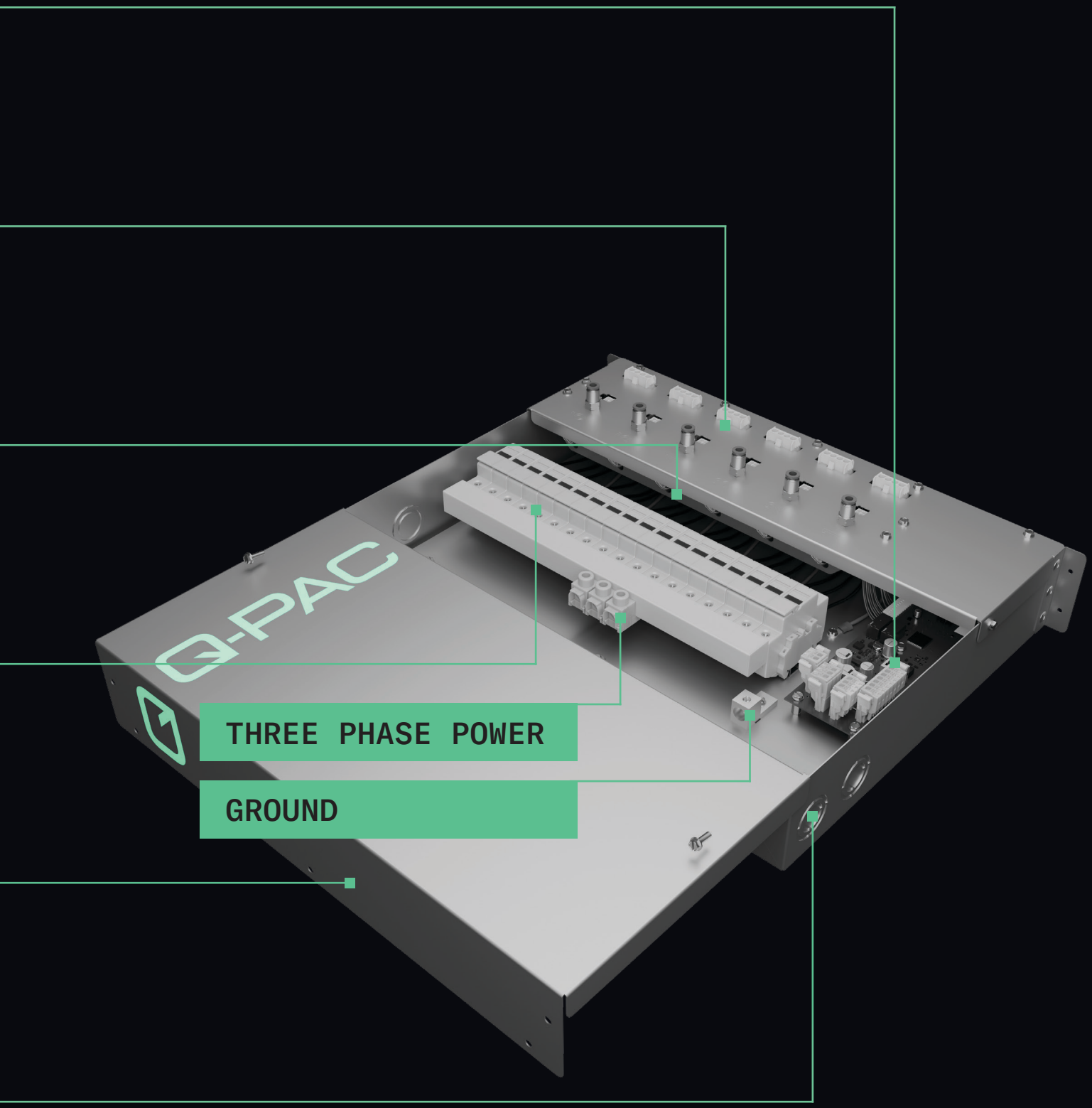
Each motor circuit is protected by a Class CC fuse rated at either 15A or 20A, depending on the fan configuration. These fuses are integrated into the Fan Controller to provide overcurrent protection and support reliable operation.

## REMOVABLE ACCESS COVER

The Fan Controller features an access cover that can be removed with a standard slotted or hex tool. Removing the cover provides direct access to the power and control terminals, making wiring straightforward. A printed wiring diagram is included inside for quick reference during setup or service.

## CONDUIT KNOCKOUT PORTS

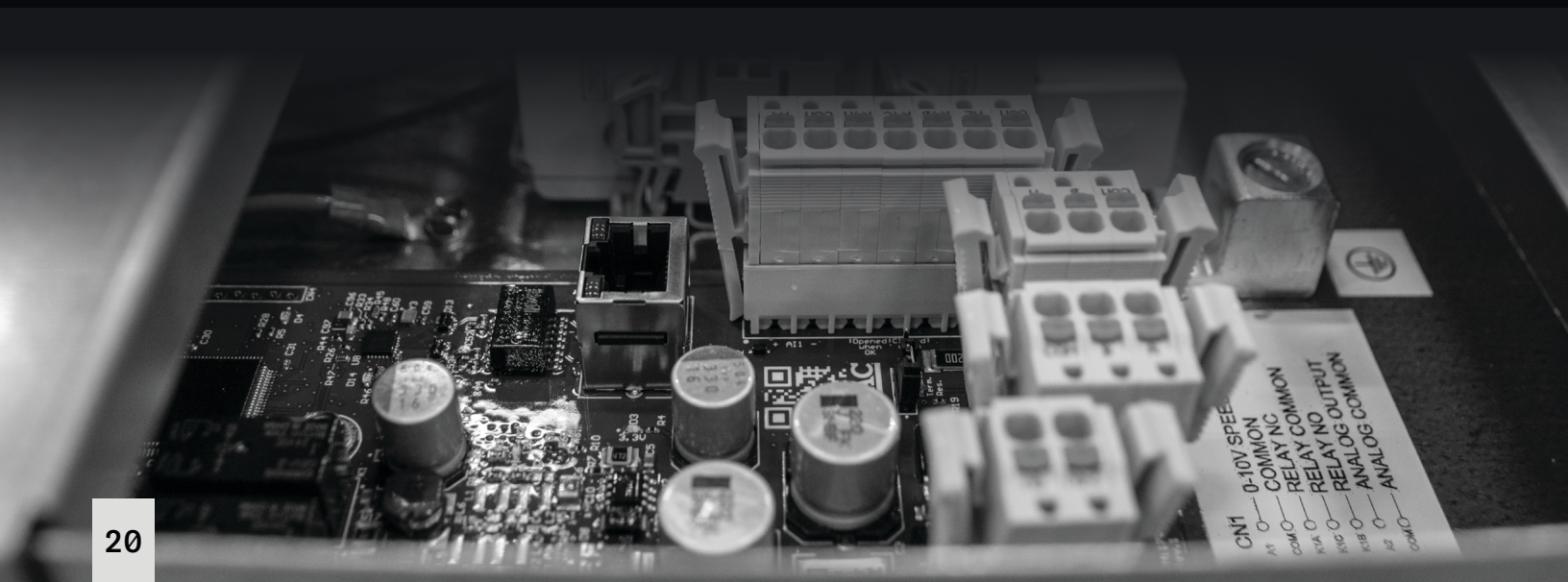
The enclosure includes knockout ports on both the top and bottom panels. These ports support 1/2”, 3/4”, and 1” trade-size conduit fittings for flexible wiring configurations.

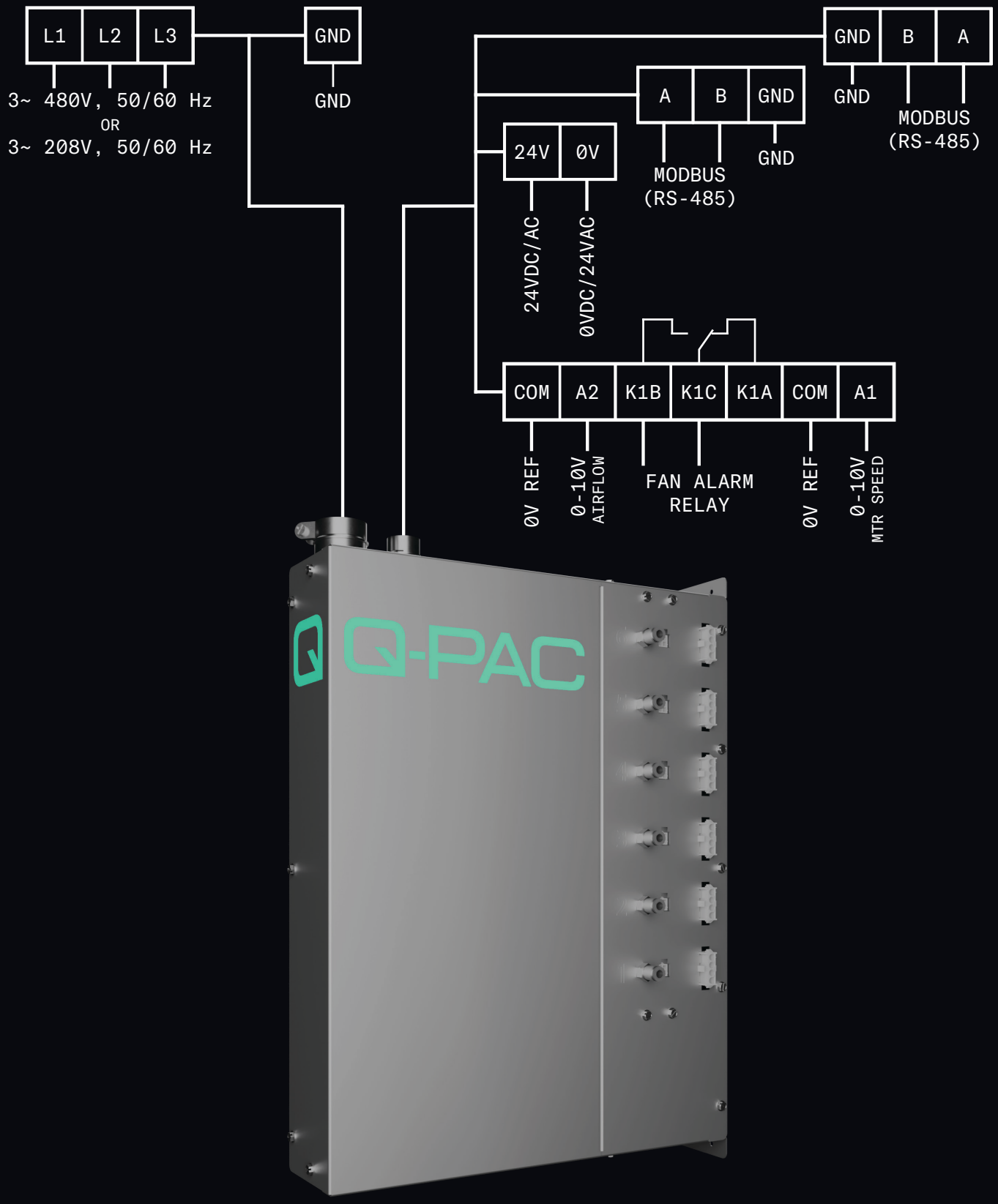

Q-PAC
THREE PHASE POWER
GROUND

# FAN CONTROLLER BOARD

The Fan Controller connections are given below. Only three phase power and AI1+/AI1- connections are required for operation.

| | | |
|---|---|---|
| **CN1 \| ANALOG INTERFACE** | | |
| A1 | 0-10V signal proportional to motor speed. | Input speed signal is operable regardless of whether controller board 24V is supplied. |
| COM | 0-10V reference for AI1+. | |
| K1A | Normally closed contact of the alarm relay. | The alarm relay provides a dry contact that changes state if any motor fault occurs.<br><br>Fault active: K1A-K1C open, K1B-K1C closed. |
| K1C | Common contact of the alarm relay. | |
| K1B | Normally open contact of the alarm relay. | |
| A2 | 0-10V signal proportional to the fan airflow. | Signal updates in real time and is scaled to the fan setup. Calibration values are in the User Manual. |
| COM | 0V reference for AO1+. | |
| **CN3 \| BOARD POWER SUPPLY** | | |
| **24V** | 24V AC/DC power supply voltage. | Fan Controller Board power supply; see User Manual for maximum voltage ratings. |
| **0V** | 0VDC ground / 24VAC power supply. | |
| **CN5 & CN6 \| COMMUNICATIONS** | | |
| **A** | Communications port +. | Modbus RTU over RS-485 via interchangeable communication ports (CN5 and CN6) for IN and OUT. |
| **B** | Communications port -. | |
| **GND** | Communications port ground. | |




L1
L2
L3
3~ 480V, 50/60 Hz
OR
3~ 208V, 50/60 Hz
GND
GND
GND
B
A
GND
MODBUS
(RS-485)
A
B
GND
MODBUS
(RS-485)
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24V
0V
24VDC/AC
0VDC/24VAC
COM
A2
K1B
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Q-PAC

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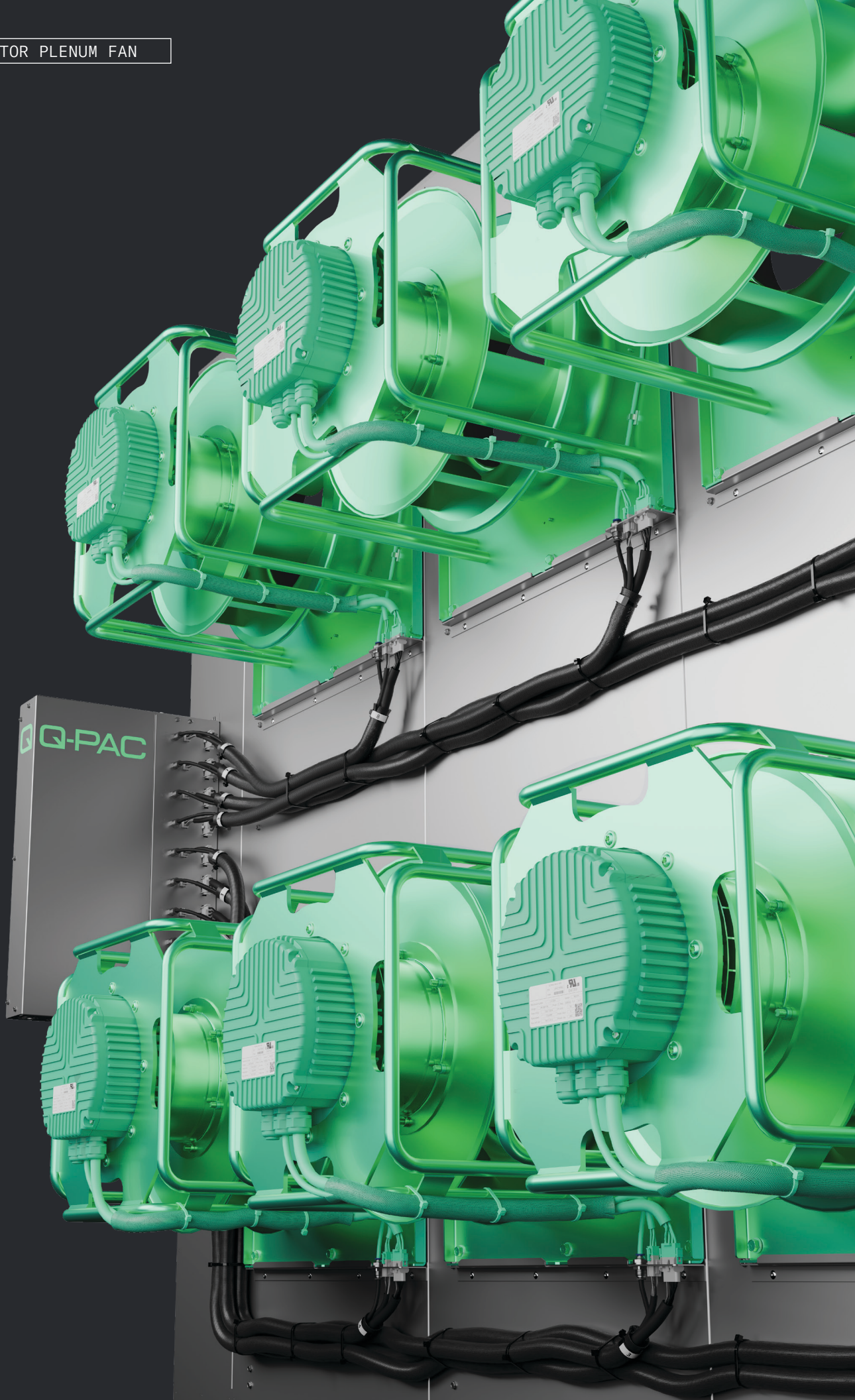

# ECM PLUG FANS

## EFFICIENT AIR MOVEMENT, BUILT IN

The Q-PAC Multimotor Plenum Fan uses electronically commutated motor (ECM) plug fans as its primary air movers because, today, they offer the most efficient and controllable motor technology available for this application. Their compact form factor and built-in variable-speed capability allow each fan to integrate cleanly into the frame, arriving pre-wired and pressure-tested for fast installation and dependable airflow.

Just as important, the system is designed around interchangeability. Plug fans do not require installation-specific addressing or custom harness lengths, which means a single spare can replace any failed motor within a Q-PAC Fan or across multiple Q-PAC Fans using the same model. That flexibility reduces downtime, simplifies spares planning, and keeps maintenance straightforward.

Q-PAC's system design emphasizes performance, maintainability, and long-term flexibility. The Multimotor Plenum Fan integrates today's most efficient air mover technology in a way that simplifies field replacement and supports consistent performance across units without locking you into rigid configurations.

## PROVEN PARTNERS IN AIRFLOW

Q-PAC supports a range of field-proven EC plug fan manufacturers:

- Ziehl-Abegg
- ebm papst
- Rosenberg

Q-PAC's engineering team continues to explore additional motor platforms with the goal of improving performance and efficiency while simplifying system features and reducing overall cost.

## MOUNTING PLATE

The mounting plate serves as the base for the entire plug fan assembly. It secures both the mounting frame and the inlet cone, creating a rigid interface between the fan and the larger structure, the Q-PAC Fan Frame. Positioned behind the mounting frame, it supports clean, one-sided installation and ensures the entire assembly stays aligned and stable.

## MOTOR SUSPENSION

The motor suspension supports the motorized impeller and ensures precise alignment with the inlet cone. It also provides a stable surface for securing the motor harness. It keeps everything in place and makes fan replacement straightforward when the time comes.

## MOTORIZED IMPELLER

This is the core of the plug fan: a direct-drive motor paired with a backward-curved impeller. The impeller mounts directly to the motor shaft, creating a compact, efficient assembly that delivers airflow without belts, pulleys, or external drives.

## INLET CONE

Mounted on the intake side of the plug fan, the inlet cone guides airflow smoothly into the impeller to improve efficiency and reduce turbulence. Fan performance is measured based on the pressure differential across this cone, making it a critical reference point for system control.

## MOTOR HARNESS

The motor harness is a plug-and-play connection between each plug fan and the corresponding Frame Harness. It includes separate cables for power and control, enclosed in a UL VW-1-compliant sleeve for durability and fire safety. A dedicated pressure tube runs along the mounting plate to connect the inlet cone's pressure nozzle back to the Frame Harness. Each harness is clearly labeled to match its fan location, simplifying installation and service.

# PLUG FAN REPLACEMENT

Electrical components wear out. That's reality—not failure. The Q-PAC Fan is built with this in mind. When a plug fan needs replacing, it takes just a few bolts and plugs, and a few minutes, to swap it out.

Q-PAC plug fan assemblies range from 44 to 140 pounds. That's not featherweight, but it's a fraction of the size and weight of a motor for a traditional blower or fan array cube. That difference matters. Lighter assemblies mean smaller crews, no rigging, and no cranes. Most replacements can be handled by one person with basic tools and minimal disruption. That saves time, reduces labor costs, and avoids the logistics that usually come with fan maintenance, especially in tight mechanical rooms or retrofitted spaces.

And because the Q-PAC Fan uses multiple plug fans, it's built with resiliency in mind. Even if one motor stops running, the rest of the motors continue delivering airflow. That gives facility teams the breathing room to schedule replacements on their terms, without rushing and without risking performance. The system remains online, maintaining airflow requirements until the replacement is made.

Looking ahead, Q-PAC's engineering team is actively exploring ways to reduce the labor, weight, and cost tied to motorized impeller replacement. From serviceable designs to recyclable components, the goal remains the same: deliver a fan system that's not only reliable but resilient over time.

## RESILIENCE MEANS STAYING ONLINE—EVEN WHEN ONE MOTOR ISN'T.


Q-PAC
ECblue
ZIEHL-ABEGG

# TYPICAL APPLICATIONS

The Q-PAC Fan is engineered for comfort cooling in commercial buildings: schools, offices, hospitals, data centers, and other spaces where people work, heal, learn, and breathe. It's built to meet the demands of real environments, not just ideal conditions.

The fan system is rated for ambient temperatures between 104 °F (40 °C) and -20 °F (-29 °C), with non-condensing relative humidity from 5% to 95%. Each motor is housed in an IP54-rated enclosure, while the Fan Controller carries an IP20 rating.

Typical applications include:

| | |
|---|---|
| **COMMERCIAL BUILDINGS** | Office spaces, retail environments, hotels, restaurants, and convention centers |
| **INSTITUTIONS** | Hospitals, healthcare facilities, schools, colleges and universities, and religious centers |
| **ENTERTAINMENT VENUES** | Sports arenas and stadiums, museums, and theaters |
| **TRANSPORTATION FACILITIES** | Airports, train stations, and other transportation hubs |
| **LIGHT INDUSTRIAL FACILITIES** | Warehouses, distribution centers, and clean-room manufacturing |

While the Q-PAC Fan is built for a wide range of commercial applications, it's not designed for every environment. Certain conditions fall outside its intended use and for good reason.

The Q-PAC Fan is **NOT** intended for use in:

- Corrosive or explosive environments
- Heavy industrial facilities
- High-temperature applications (above 104°F / 40°C)
- Wet or high-moisture environments, including cooling towers or washdown zones
- Outdoor/rooftop installations without full environmental enclosure


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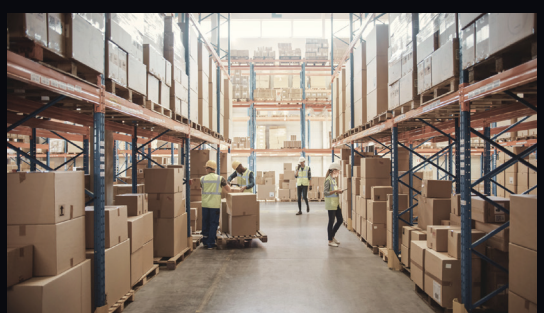
EMERGENCY
South Entrance

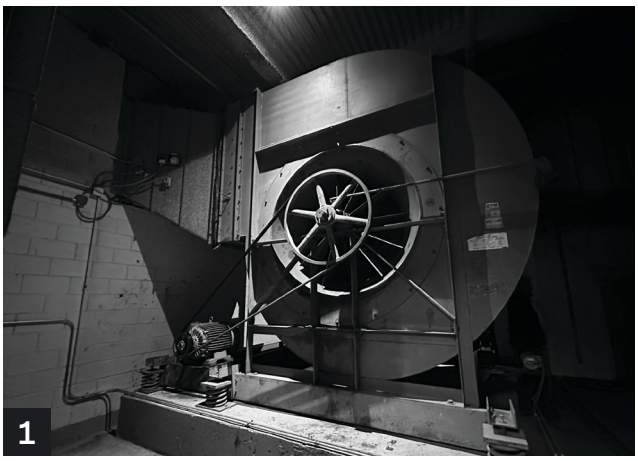

BASKETBALL TOURNAMENT
LET THE STRONGEST WIN!



# FAN REPLACEMENT

The Q-PAC Fan is a strong fit for many common commercial fan replacement projects, especially where downtime, labor, or footprint are major concerns, as long as a few key conditions are met:

- 3 Phase power (200-240V or 440-480V)
- Operating static pressure between 1 and 9 inWc.
- Airflow requirements of:
  - 4,000 to 90.000 CFM (single Q-PAC Fan)
  - Up to 300,000 CFM (multiple Q-PAC Fans)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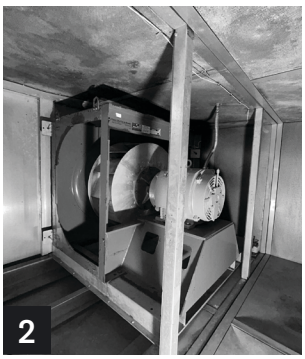
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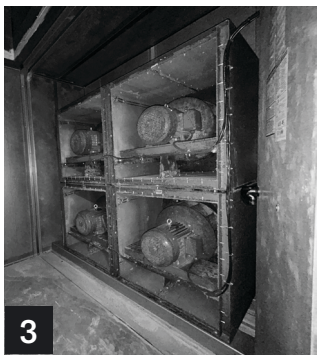
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## COMMON REPLACEMENT APPLICATIONS

The Q-PAC Fan is commonly used to replace:

- Centrifugal blowers [1]
- Plenum fans [2]
- AC/EC fan arrays and fan walls [3]

The Q-PAC Fan can replace some axial fans, but doing so often requires relocating ductwork and moving the fan closer to the coils to work within a plenum space.

- Tube axial fans
- Vane axial fans
- Direct drive axial fans

The Q-PAC Fan is versatile but not universal. The list below outlines environments and applications that fall outside the system's intended use. These conditions can create challenges that affect performance, safety, or serviceability, making them a poor match for Q-PAC's design priorities.

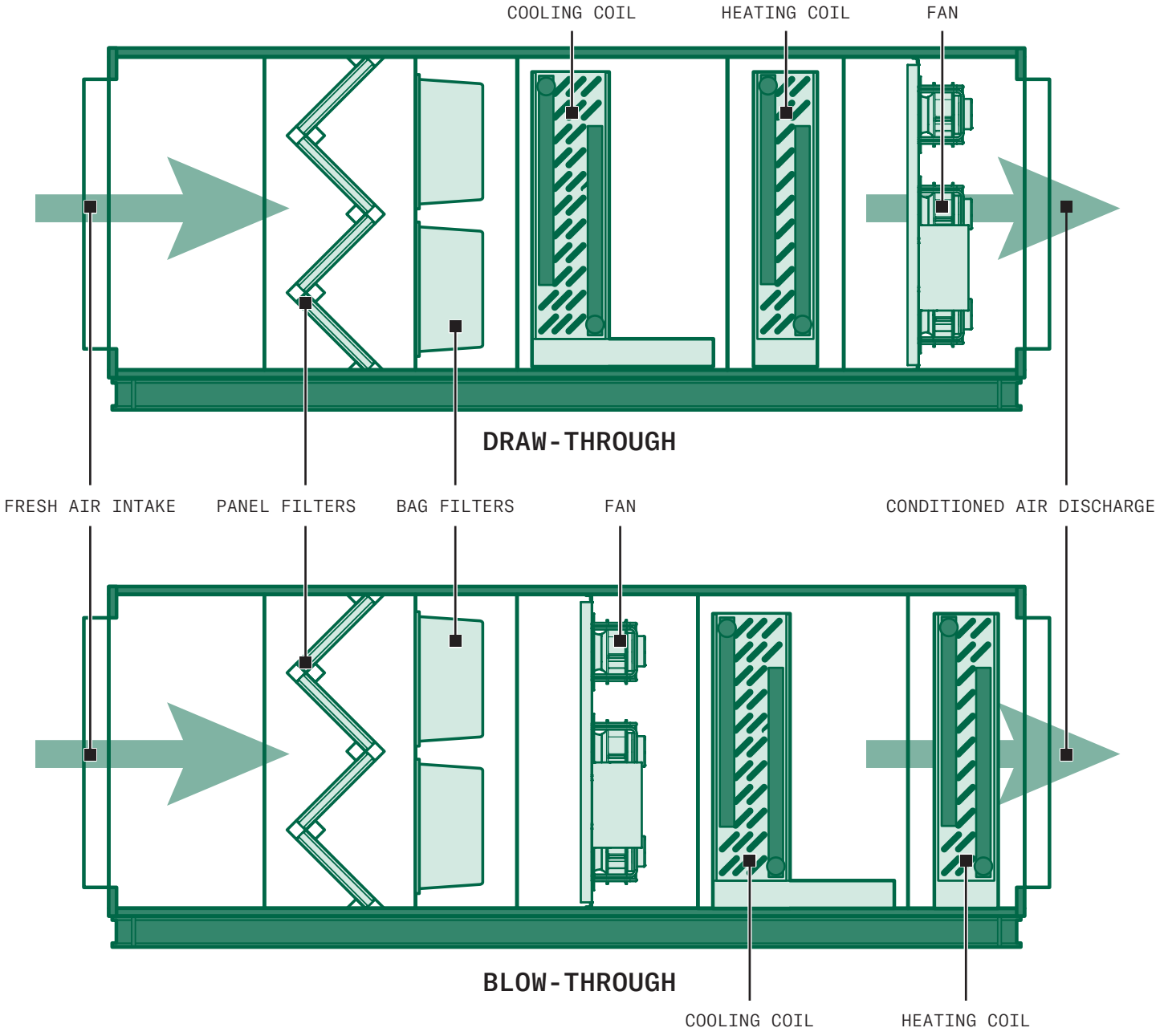
| APPLICATION | EXPLANATION |
|---|---|
| **HIGH TEMPERATURE FANS**<br>Oven/kiln fans and furnace/heat-treating exhaust fans | The EC motors used in the Q-PAC Fan are not rated for temperatures above 104 °F / 40 °C |
| **PROCESS OR MATERIAL HANDLING FANS**<br>Radial blade fans, paddle wheel fans, and fans designed for moving particulate-laden air (dust, chips, debris) | The impellers used in the Q-PAC Fan are not intended for handling solid particles or aggressive airflow applications. |
| **CORROSION-RESISTANT OR CHEMICAL DUTY FANS**<br>Fiber-reinforced plastic (FRP), polypropylene, or epoxy-lined fans | Q-PAC Fans are designed for comfort cooling applications and do not use corrosion-proof materials. |
| **EXPLOSION-PROOF / HAZARDOUS LOCATION FANS**<br>UL Class 1, Division 1 or 2 Fans and spark resistant fans (AMCA Type B or C) | The Q-PAC Fan is not explosion-proof rated and should not be used in classified environments. |
| **SANITARY OR WASHDOWN FANS**<br>Stainless sanitary fans, NSF-certified fans, and IP66-rated fans | Q-PAC does not use sealed components or stainless steel materials and is not rated for hygienic or washdown conditions. |
| **ULTRA-LOW OR ULTRA-HIGH FLOW FANS**<br>Residential or miniature utility fans (< 2,500 CFM) and axial fans (> 300,000 CFM) | A single Q-PAC Fan is intended for airflows between 2,500 and 90,000 CFM, depending on specific fan configuration. Fans can be combined to generate airflows up to 300,000 CFM. |

# CONFIGURATIONS

## ONE FAN. FLEXIBLE BY DESIGN.

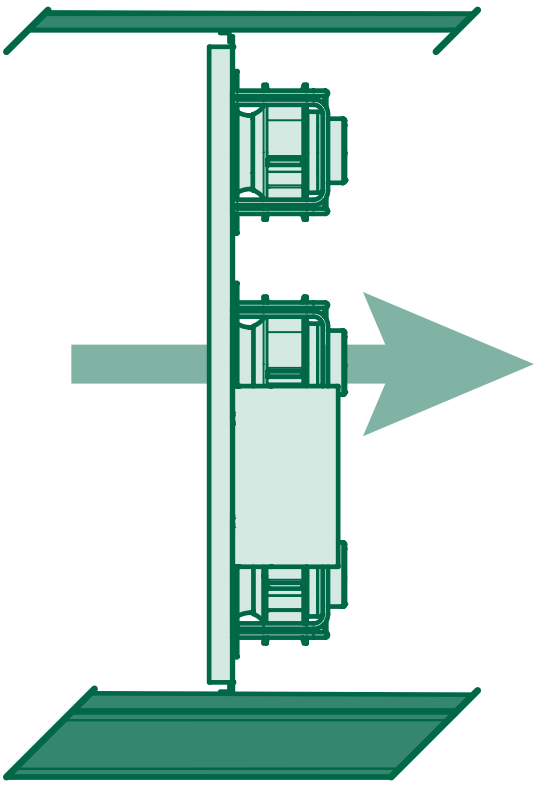
The placement of the Q-PAC Fan depends on the air handler's layout. Whether the system is designed for draw-through (after the filters and coils) or blow-through (after the filters, before the coils), the Q-PAC Fan integrates cleanly.

This flexibility makes it easy to apply the fan in new builds, retrofits, or replacements without rethinking the entire system design. Examples of both configurations are shown below.



## VERTICAL OR HORIZONTAL—IT JUST WORKS.

The Q-PAC Fan supports both horizontal and vertical airflow orientations, regardless of whether it's installed in a draw-through or blow-through configuration. This flexibility allows it to fit a wide range of air handler designs, including upright, stacked, or low-clearance units. Because each fan module is mounted within its own frame and doesn't rely on shared duct transitions or drive shafts, orientation has no effect on airflow performance, wiring, or replacement effort. The install process remains the same: fast, clean, and consistent, no matter how the air moves.



### HORIZONTAL AIRFLOW

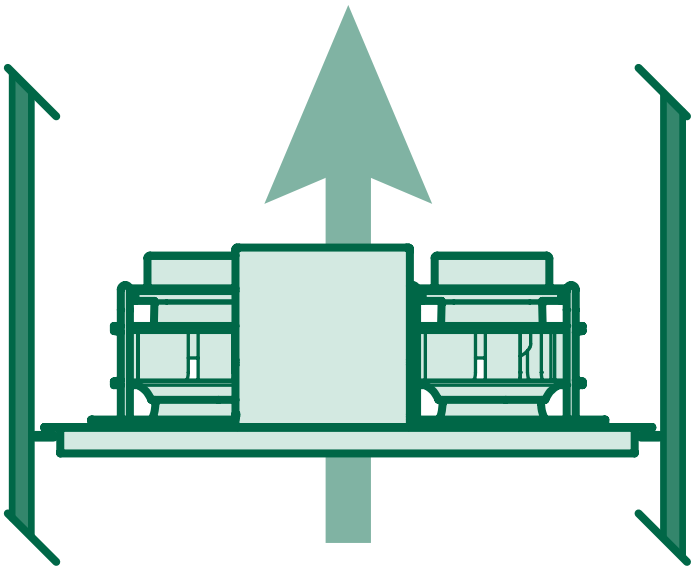
In this orientation, the Q-PAC Fan is installed in-line with the filters and coils, with airflow moving parallel to the floor. This is the most common and recommended configuration for both new and replacement installations.

In some retrofit cases, a slight tilt may be beneficial, especially when vertical ductwork is located immediately downstream of the fan. When tilting is required, Q-PAC recommends limiting the angle to 15 degrees or less, with no more than 12 inches of setback from the mounting surface.

### VERTICAL AIRFLOW

Often referred to as "upblast" or "downblast," vertical airflow is common in tight mechanical rooms or when air needs to reach adjacent floors. While fully supported by the Q-PAC Fan design, this orientation shifts the weight distribution of key components and may affect service access.

For applications with an effective fan height over 80 inches, Q-PAC recommends contacting our team to confirm proper support and installation planning.

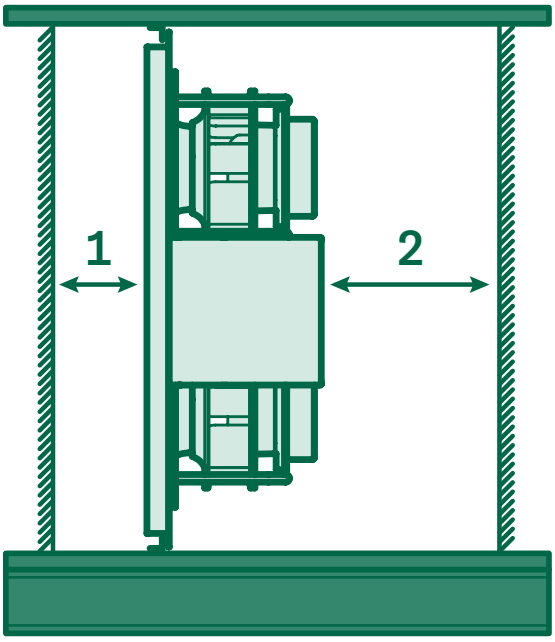


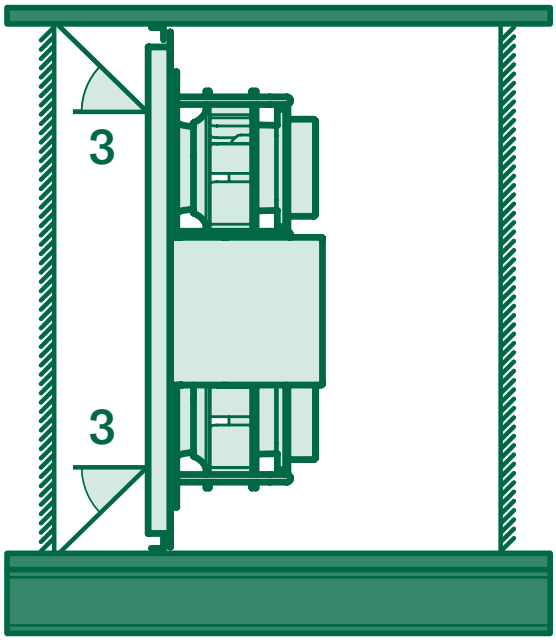
# CLEARANCES

To ensure proper airflow and allow safe, efficient service access, Q-PAC recommends a minimum fan section length of 76 inches of unobstructed space. This includes both inlet clearance and discharge/maintenance clearance. The extra space supports airflow development on both sides of the fan and provides the room technicians need to work without constraint.

| | |
|---|---|
| **INLET CLEARANCE [1]**<br>The distance between the upstream filters or coils and the face of the Q-PAC Fan inlet. | > 18in |
| **DISCHARGE CLEARANCE [2]**<br>The distance between the fan's discharge end (motors and Fan Controller) and any downstream ductwork, coils, or obstructions. | > 36in |
| **INLET ANGLE [3]**<br>The angle between the top or bottom edge of the upstream filters or coils and the nearest inlet cone of the Q-PAC Fan. | < 45° |

If these clearance guidelines can't be met, Q-PAC recommends adjusting the fan selection to account for increased static pressure requirements.



Proper discharge setup is key to maximizing airflow performance and maintaining safe, accessible service space around the Q-PAC Fan. The guidelines below help ensure air moves efficiently into downstream ductwork, especially in systems with multiple rows or columns of impellers.

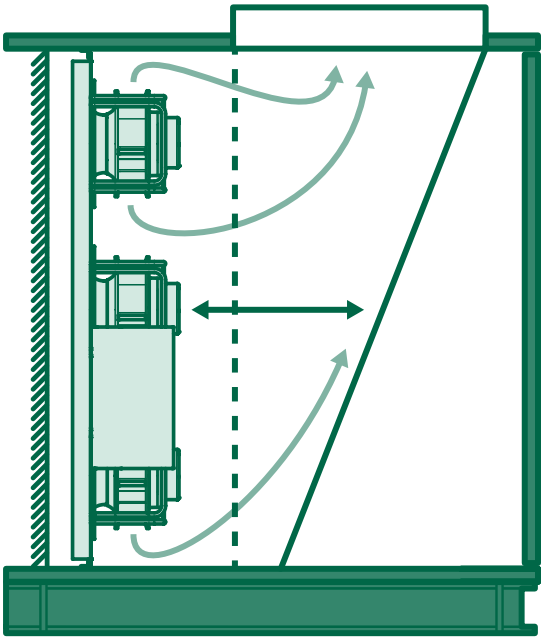
## FAN-TO-DUCT CLEARANCE RULES

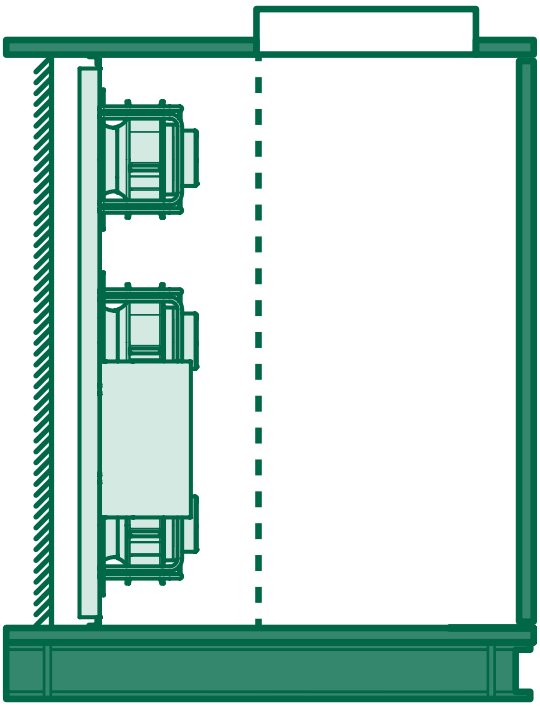
- For vertical duct openings, it is recommended to keep a minimum of 12 inches from the end of the motor(s) to the center of the directing surface (turning vanes or duct wall).
- For sharp (90°) transitions, maintain a distance of at least one full impeller diameter—typically 12 to 22 inches, depending on motorized impeller.
- Avoid direct discharge (impeller blades directly in front of duct opening) except in cases of a single row or single column of motors:
  - SINGLE ROW (VERTICAL DUCT)

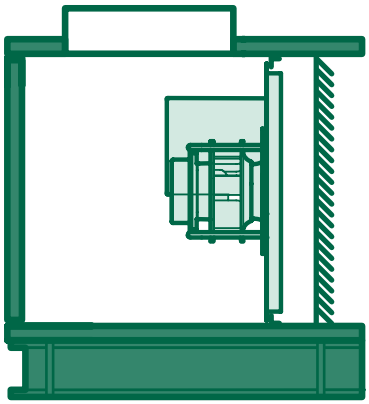
    If the fan has only one row of motors (one motor per fan panel), the impellers can discharge directly into a vertical duct, above or below the fan.

  - SINGLE COLUMN (HORIZONTAL DUCT)

    If the fan has only one column of motors (a single motor panel), the impellers can discharge directly into a side duct, to the left or right.
- Always ensure there's enough space around the fan assembly to remove and replace plug fans safely. Even when direct discharge is allowed, leave room for service access.





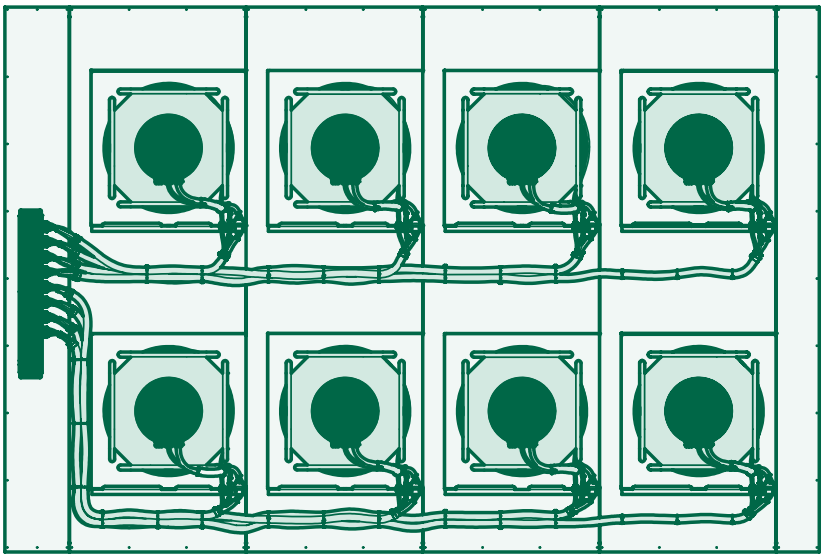


# FAN SELECTION

## GETTING THE RIGHT FAN FOR THE JOB

Accurate fan selection starts with a few key details. To generate a Q-PAC Fan selection, you'll need to know:

- System airflow (CFM)
- Static pressure (inWc)
- Air handler dimensions
- Available power supply
- Optional system accessories—like a fused disconnect or control panel.



**SYSTEM AIRFLOW**

The required CFM (cubic feet per minute) that the fan must deliver to meet system needs. This is the baseline for sizing the fan and determining the number of motors needed.

**STATIC PRESSURE**

The total external static pressure the fan must overcome, measured in inches of water column (inWc). This includes pressure losses from coils, filters, ductwork, and other system components.

**AIR HANDLER DIMENSIONS**

The available width, height, and depth of the fan section or plenum space.

**POWER SUPPLY**

The available voltage and phase (typically 200–240V or 440–480V, 3-phase). This determines which motors and components are compatible with the system.

**SYSTEM ACCESSORIES**

Optional accessories that provide fused disconnects, manual overrides, and automated control or communication capabilities beyond the base fan.

## START WITH ACCURATE AIRFLOW AND DIMENSIONS.

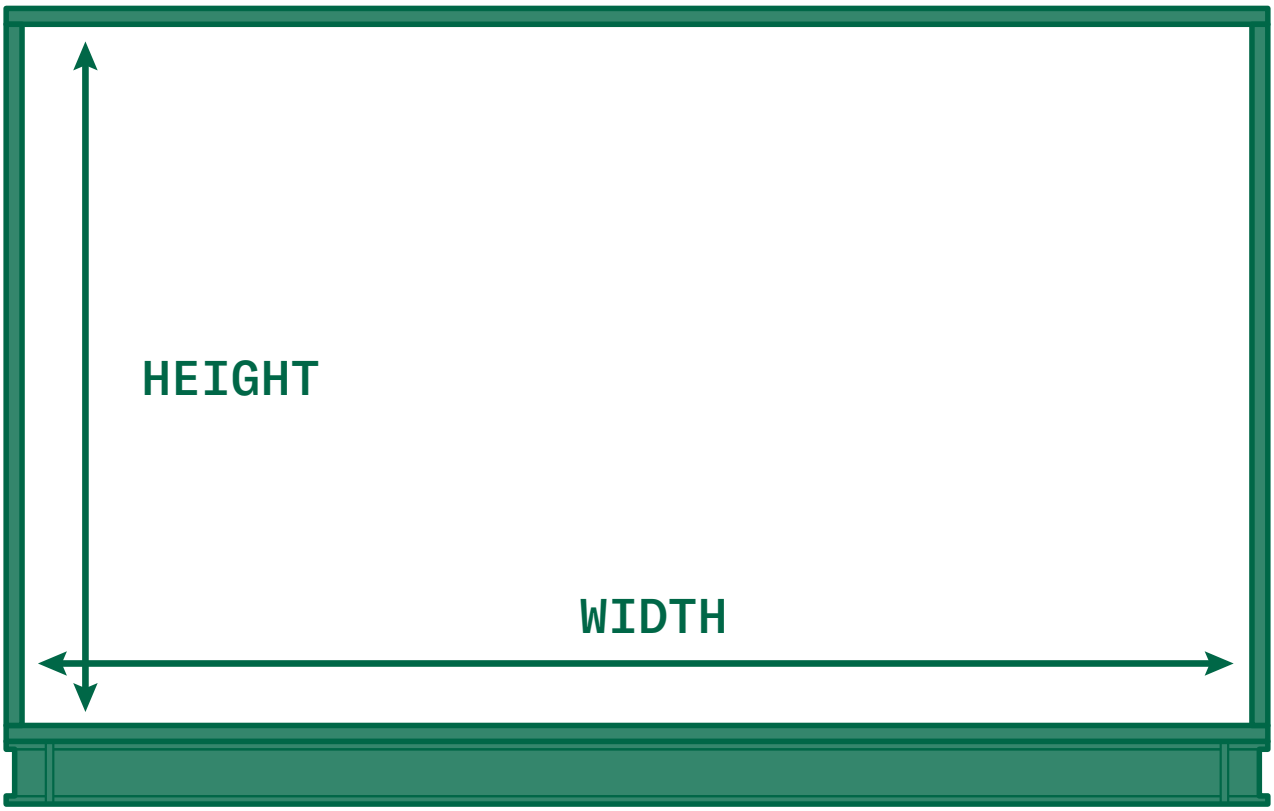
Airflow should be based on the performance of the original or existing fan, or as defined by the specifying engineer or relevant authority. A single Q-PAC Fan can generate 4,000 to 90,000 CFM at 1-9 inWc. Two or more Q-PAC Fans can be installed in parallel to generate higher airflows.

Ensure the fan section provides at least 76 inches of unobstructed length and a suitable mounting surface. The Q-PAC Fan mounts directly to the existing fan structure or to the walls, floor, and ceiling of the air handler using the included adapter angles.

Dimensions must be carefully measured from wall-to-wall and floor-to-ceiling inside the air handler.

To ensure accuracy:

- Measure in multiple locations to check for squareness.
- All measurements should fall within a 0.5-inch range.
- Use the average of all measurements when specifying the fan.
- Do not reduce dimensions to compensate for fit; each Q-PAC Fan includes a built-in 0.5-inch tolerance to accommodate normal construction variances.



# BUYING THE Q-PAC FAN

**ONE FAN. MANY WAYS TO BUY.**

Whether you're replacing a single blower or designing an entire HVAC system, the Q-PAC Fan is available through the path that makes the most sense for you. No forced channels, no barriers, just straightforward access built to match how today's customers want to buy.

Q-PAC's go-to-market strategy is simple: give buyers choice, support integration partners, and make the process frictionless from specification to installation.

## 1 ONLINE RETAIL

ORDER AND INSTALL ALL ON YOUR OWN

For teams managing their own projects, or those with installation support already in place, **q-pac.com** offers a fast, direct way to order the Q-PAC Fan. This retail path provides similar pricing with what you'd expect through a systems integrator or OEM, giving you flexibility in how you buy without tradeoffs in cost. It's a streamlined option for experienced contractors, facility teams, and retrofit specialists who prefer to manage installation independently.

You get the same fan, the same warranty, and the same direct access to Q-PAC support, without waiting on quotes or coordinating through third parties.

Start your order using the online configurator, where you can size, price, and document a fan built to your exact project requirements.

## 2 THROUGH PREFERRED PARTNERS

TURNKEY INTEGRATION. LOCAL SUPPORT.

Q-PAC works with qualified systems integration partners who deliver complete, field-executed fan solutions. These partners can support the full scope of a project, from design and installation to controls, commissioning, and long-term service, making them the best option for complex replacements or sites that want a single accountable team.

If you already have a preferred HVAC vendor or reseller, they can purchase Q-PAC Fans directly through Q-PAC and deliver the solution through their existing relationship with you. If you don't have a local partner, Q-PAC can provide a list of qualified integrators in your area.

This path is designed to expand access and improve execution, not compete with OEM-integrated solutions or undermine partner work.

## 3 THROUGH OEM INTEGRATION

Q-PAC INSIDE, RIGHT FROM THE START.

Q-PAC partners with leading air handling unit (AHU) manufacturers to have Q-PAC Fans built directly into their systems at the factory. This factory-integrated approach embeds our fan technology at the system level, just like other proven component integration models in HVAC and beyond.

Buying a Q-PAC-equipped AHU from the factory eliminates the need for aftermarket retrofits or field modifications, saving time, labor, and cost during installation. It also ensures consistent performance and simplifies coordination between mechanical, electrical, and controls teams.

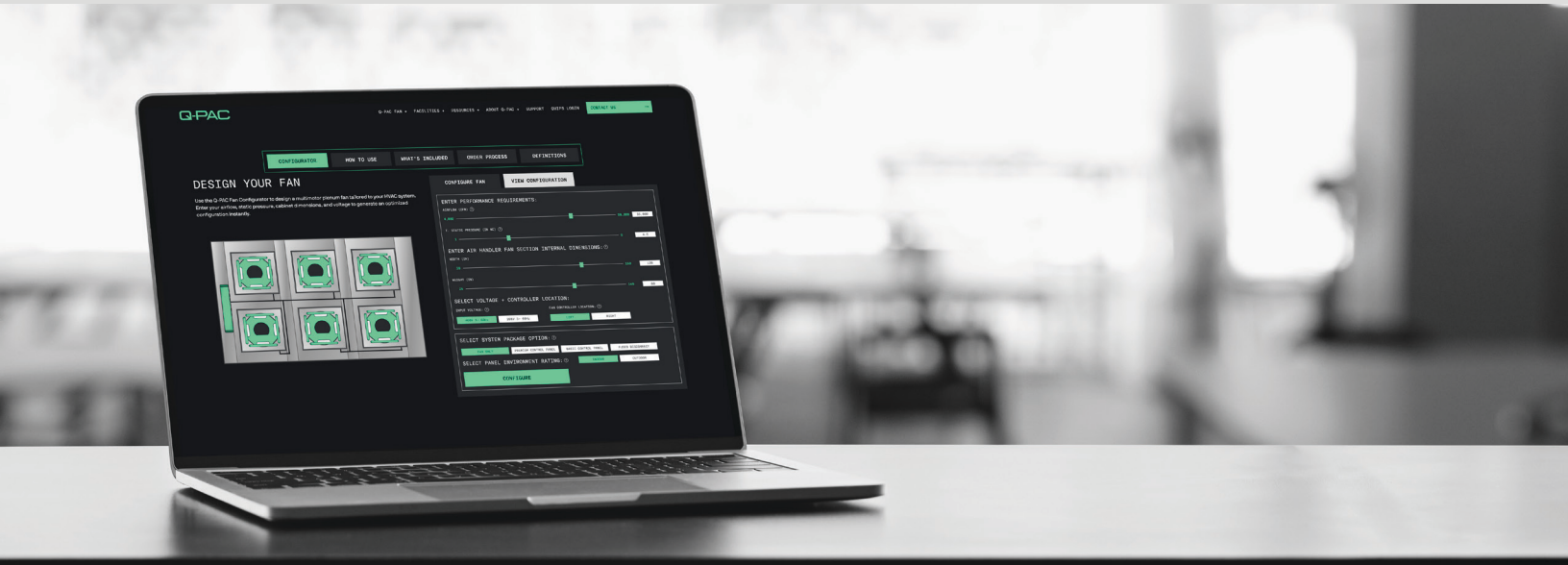
This OEM path is designed to scale adoption and standardize performance, not to bypass local partners or compete with field-installed solutions. It is another way Q-PAC makes high-performance fan systems more accessible, however you choose to buy.

# ONLINE CONFIGURATOR

The Q-PAC Fan Configurator at **q-pac.com** makes it easy to build a fan system tailored to your exact project. Just enter five key details: airflow, static pressure, cabinet size, voltage, and Fan Controller location. The configurator returns a complete solution that fits your performance and space requirements. It automatically selects the best match based on efficiency, power usage, and cost.

From there, you can add optional accessories like a Q-PAC Control Panel or fused disconnect, review pricing, download system documents, and submit your order without any back-and-forth.

For channel partners such as system integrators, installation partners, AHU reps, and OEMs, Q-PAC also offers QUIPS, our CPQ platform built for higher order volumes and advanced quoting and order management.



# MOUNTING THE FAN

The Q-PAC Fan is designed to mount to a structural flange inside the air handler. This flange may already exist as part of the AHU or can be supplied with the Q-PAC Fan for new installations—see Perimeter Angles.

## MOUNTING TO AN EXISTING FLANGE

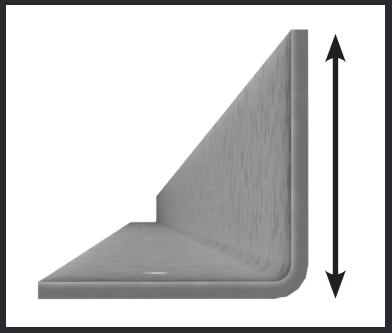
If mounting to an existing flange, it must meet the following criteria:

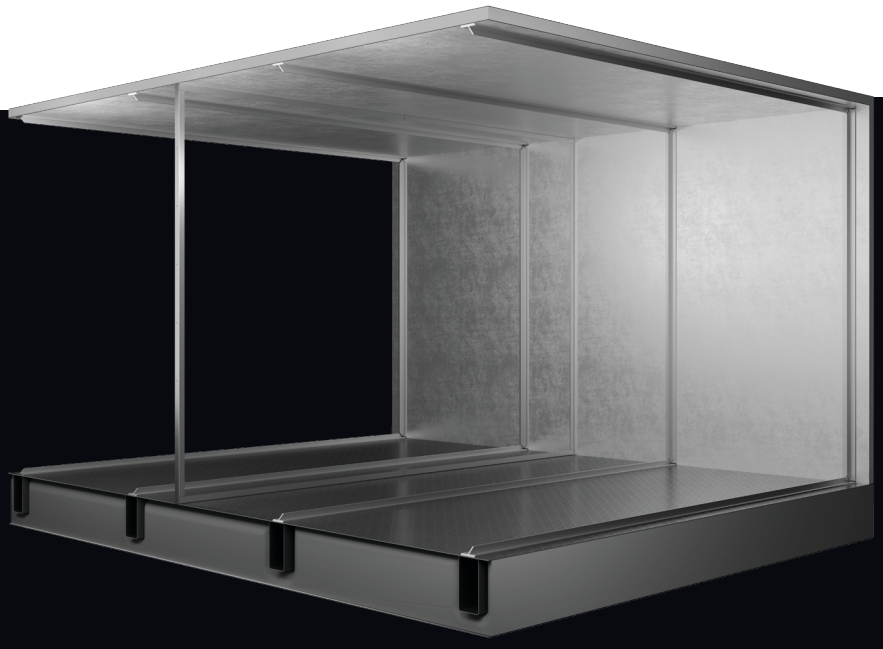
| | |
|---|---|
| **SIZE** | 0.625 in minimum<br>1.250 in maximum<br>See Figure [1]. |
| **MATERIAL** | Mild steel or equivalent, suitable rigid material. Recommended minimum thickness of 16-gauge (0.06 in). Concrete and other rigid structures are also sufficient, but may require specialized fasteners not included with the fan. |

The Q-PAC Fan and flange must be mounted to a rigid surface. Avoid mounting to flexible or unsupported materials (such as perforated metal), as this can lead to fan movement under pressure and create a risk of damage to the AHU or injury. The mounting surface must support the full perimeter of the fan. Any unsupported edges may compromise system integrity.

When installing to an existing flange, take measurements wall to wall and floor to ceiling, and confirm that the flange meets the required size specifications listed above.

Flange size is measured by the width of the uninterrupted, flat mounting surface, as shown below.





## MOUNTING WITH NO EXISTING FLANGE

This applies to cases where:

- No structural flange exists inside the air handler
- Existing flanges do not allow for recommended fan clearances
- Existing flanges do not met the required size specifications listed

In these situations, the Q-PAC Fan ships with a set of **Perimeter Angles**, which serve as the mounting interface between the fan and the air handler's internal walls, floor, and ceiling. These angles ensure proper support and allow the fan to be securely installed while maintaining the required clearances for airflow and service access.

# PERIMETER ANGLES

Perimeter Angles are formed sheet metal components made from 14-gauge G90 galvanized steel. They serve as structural adapters, enabling secure installation of the Q-PAC Fan in air handlers without a compatible flange or where existing flanges are not positioned correctly. To ensure installation flexibility, Perimeter Angles are included with every fan, on every order—no exceptions.

### WHAT'S INCLUDED

Each set includes at least four angles:

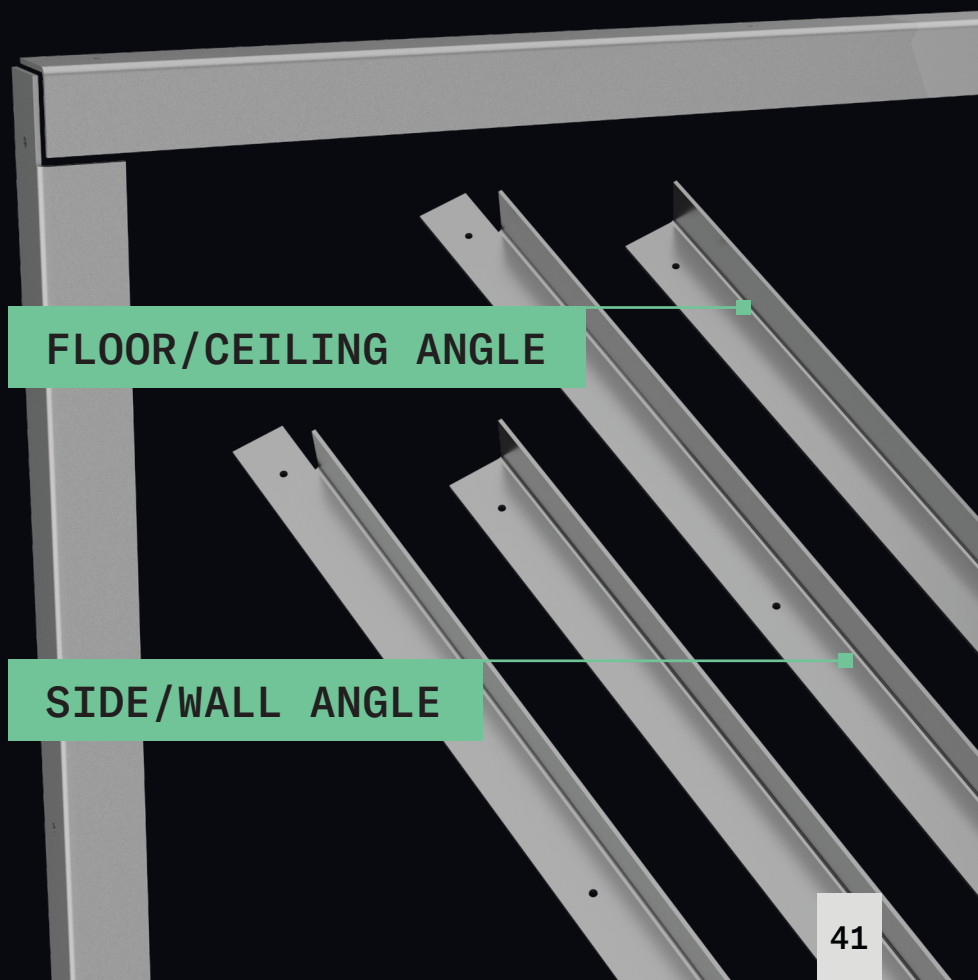
- Two for the walls
- Two for the floor and ceiling

For wider fans, the floor and ceiling angles may be shipped in multiple segments to ease transport and handling.

### INSTALLATION

When installed, Perimeter Angles feature two offsets to allow for minor dimensional and surface irregularities:

- 1/2-inch offset between Fan Frame dimensions and overall air handler dimensions.
- 1/8-inch offset between mating Perimeter Angles, shown to the right.



# INSTALLATION OPTIONS

## FACTORY-ASSEMBLED

For factory installations with access to a forklift and overhead crane, the fully assembled Q-PAC Fan is the ideal option. It arrives ready to install with no field assembly required.

Once positioned, the fan only needs to be mounted to a suitable flange (see Page 40) and wired for power and controls via the Fan Controller.

Each fan ships with a minimum of two certified lifting points, designed to support safe, secure installation into the air handler.

This method is especially well suited for production lines, where it significantly reduces the labor, time, and technical skill required for both mechanical and electrical integration.

### REQUIREMENTS

To install a fully assembled Q-PAC Fan, the following tools and equipment are recommended for safe handling and proper setup:

- Forklift
- Overhead, Jib, or Gantry crane (minimum rating of 2,500 lbs)
- Impact driver and tool bits
- Flathead screw driver
- Wire strippers

# KNOCKDOWN KIT

The Q-PAC Fan can also ship in knockdown form for field assembly. This is ideal for replacement projects or installs where moving a fully assembled fan is not practical. This option is especially useful when access to the air handler is limited, such as in retrofit jobs requiring navigation through tight spaces, stairs, or shafts.

## REQUIREMENTS

To install a knockdown Q-PAC Fan, the following tools and equipment are recommended for safe handling and proper setup:

- Minimum of two people capable of lifting up to 50 lbs.
  - Some installations may require lifting plugs fans of up to 140 lbs.
- Basic mechanical and electrical knowledge.
- Impact driver and tool bits
- Flathead screw driver
- Wire strippers
- Wire cutters

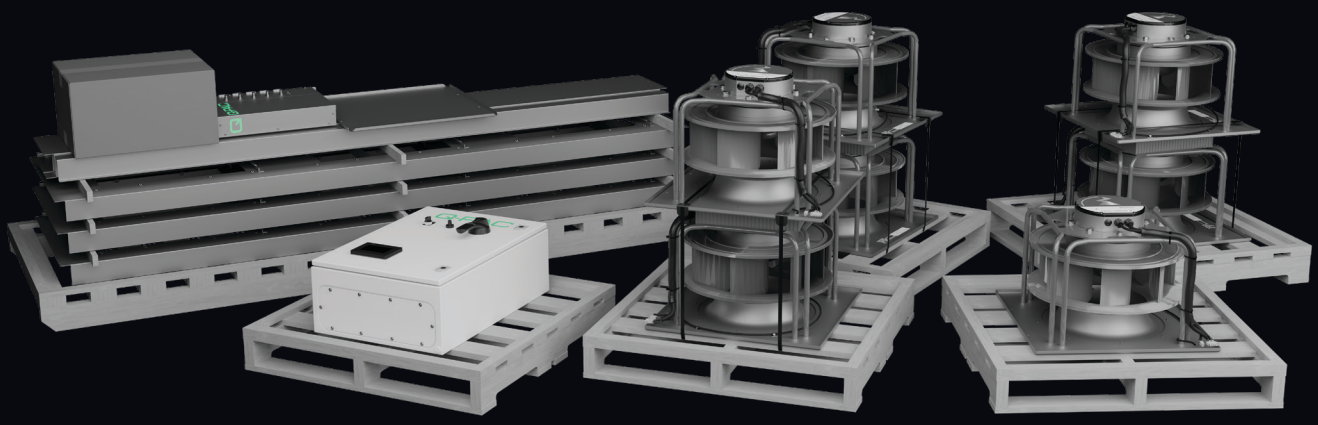
The knockdown kit is delivered on multiple pallets, separating components such as:

- The Fan Frame and Fan Controller
- Plug fans
- Optional accessories—Control Panel, fused disconnect, and/or backdraft dampers.

Most components are lightweight enough for crews to carry by hand. However, Fan Frame panels and Perimeter Angles may reach up to 140 inches in length and 32 inches in width, which can limit maneuverability in tight spaces.

Plug fans range from 50 to 140 pounds each, with sizes up to 29 inches wide and 22 inches deep. Plan for adequate clearance when transporting components through doorways, stairwells, or other restricted areas.

With the provided assembly and wiring guides, field setup is straightforward. In most cases, the fan can be fully assembled in under two hours—often less time than it takes to remove the existing fan.



# MULTI-FAN SYSTEMS

While a single Q-PAC Fan covers most applications, larger systems—up to and beyond 360,000 CFM—may require multiple fans operating in the same air stream. Q-PAC supports multi-fan configurations of up to four fans per system, all paired to a single Control Panel.

These fans install as a continuous pressure wall, using a combination of Perimeter Angles and the Coupler (see right).

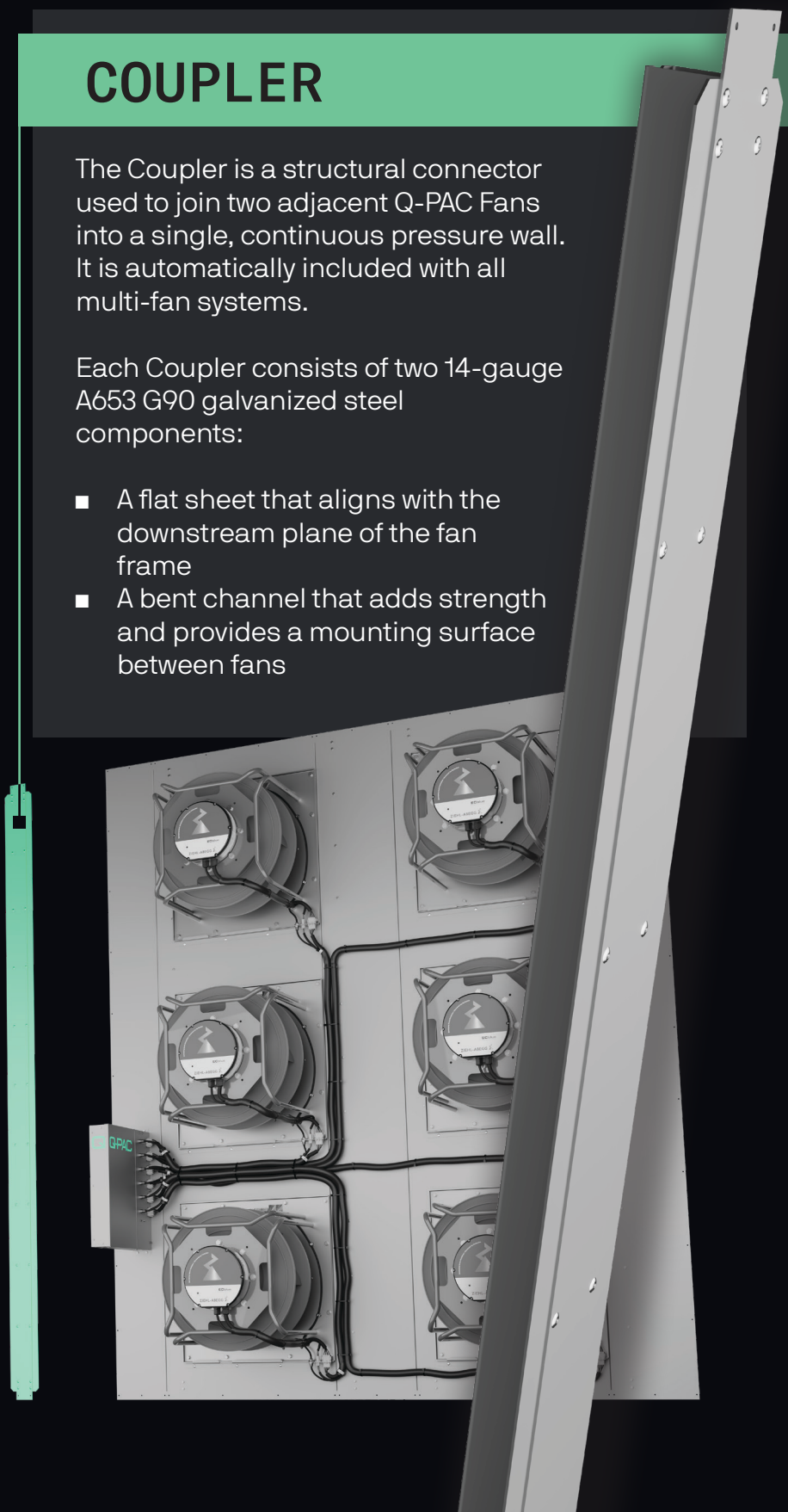
The Perimeter Angles are sized to span the full air handler dimensions as specified at the time of order. The Coupler links adjacent fans, provides a stable mounting surface, and adds structural support for additional fans.

## COUPLER

The Coupler is a structural connector used to join two adjacent Q-PAC Fans into a single, continuous pressure wall. It is automatically included with all multi-fan systems.

Each Coupler consists of two 14-gauge A653 G90 galvanized steel components:

- A flat sheet that aligns with the downstream plane of the fan frame
- A bent channel that adds strength and provides a mounting surface between fans

## MULTIPLE FANS. SAME INSTALLATION.

Installing a multi-fan Q-PAC system is a straightforward, repeatable process. It mirrors the steps used to install a single fan, with the addition of modular connections between adjacent units. Key differences are outlined below.

### ASSEMBLY

After installing the Perimeter Angles and mounting the first fan:

1. Position the Coupler's flange behind the open edge of the first fan frame.
2. Fasten the Coupler to the Perimeter Angles to secure it in place.
3. Attach the open edge of the first fan to the Coupler.
4. Mount the second fan using the remaining flange of the Coupler as the structural interface.

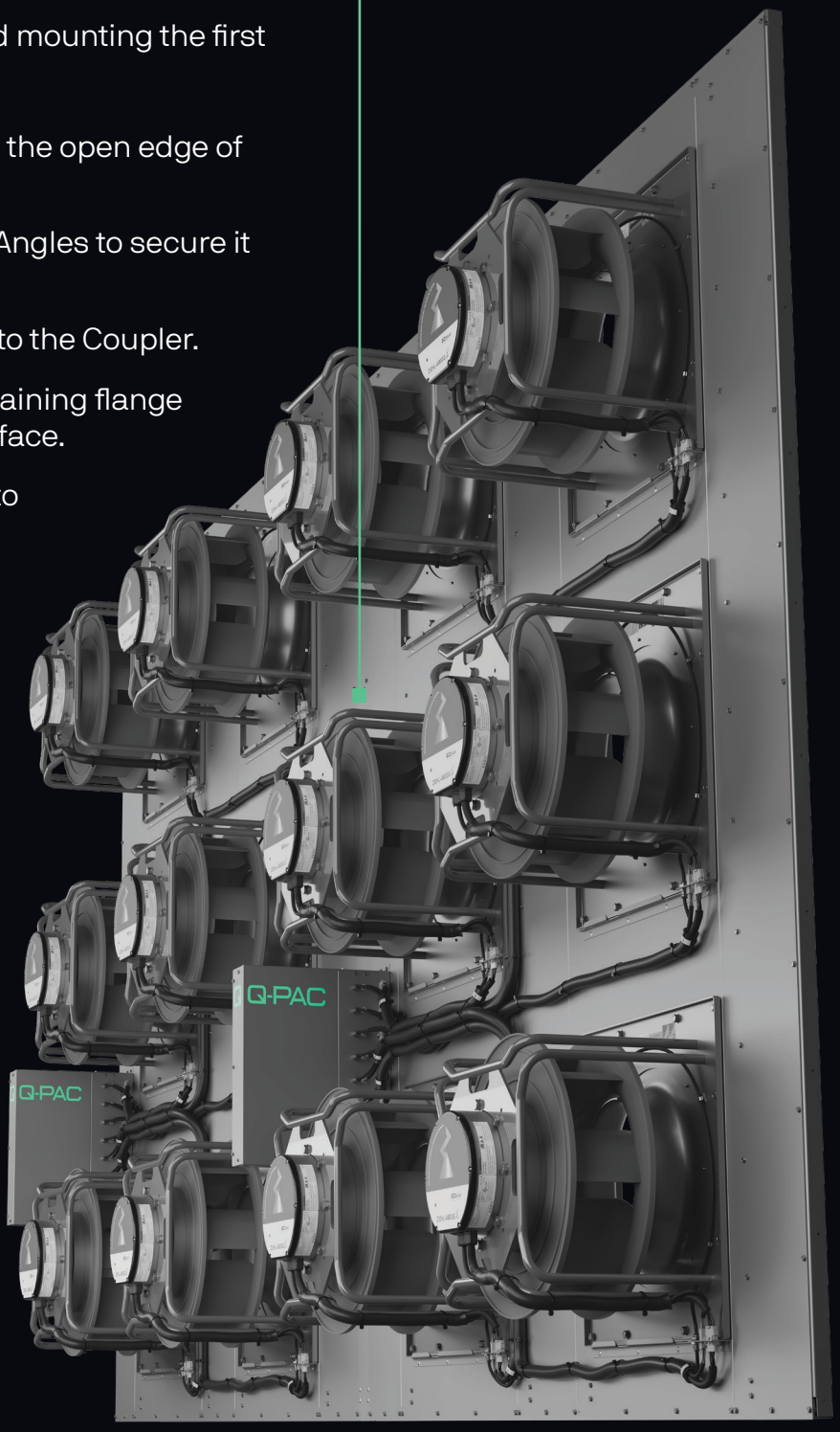
Repeat this process for additional fans to create a continuous pressure wall.

### POWER AND CONTROL

In a basic setup, each fan requires a dedicated connection for three-phase power and control signal. All fans must receive the same control input to ensure balanced performance.

For systems using Modbus communication, connections must be daisy-chained from the external control panel to each Fan Controller in sequence.

The Q-PAC Control Panel simplifies connections by providing dedicated terminals for each Fan Controller, allowing every controller to wire back to the panel directly. This setup maintains the daisy-chain logic internally—reducing field wiring complexity.



# POWER AND CONTROLS

## DIRECTLY TO THE FAN

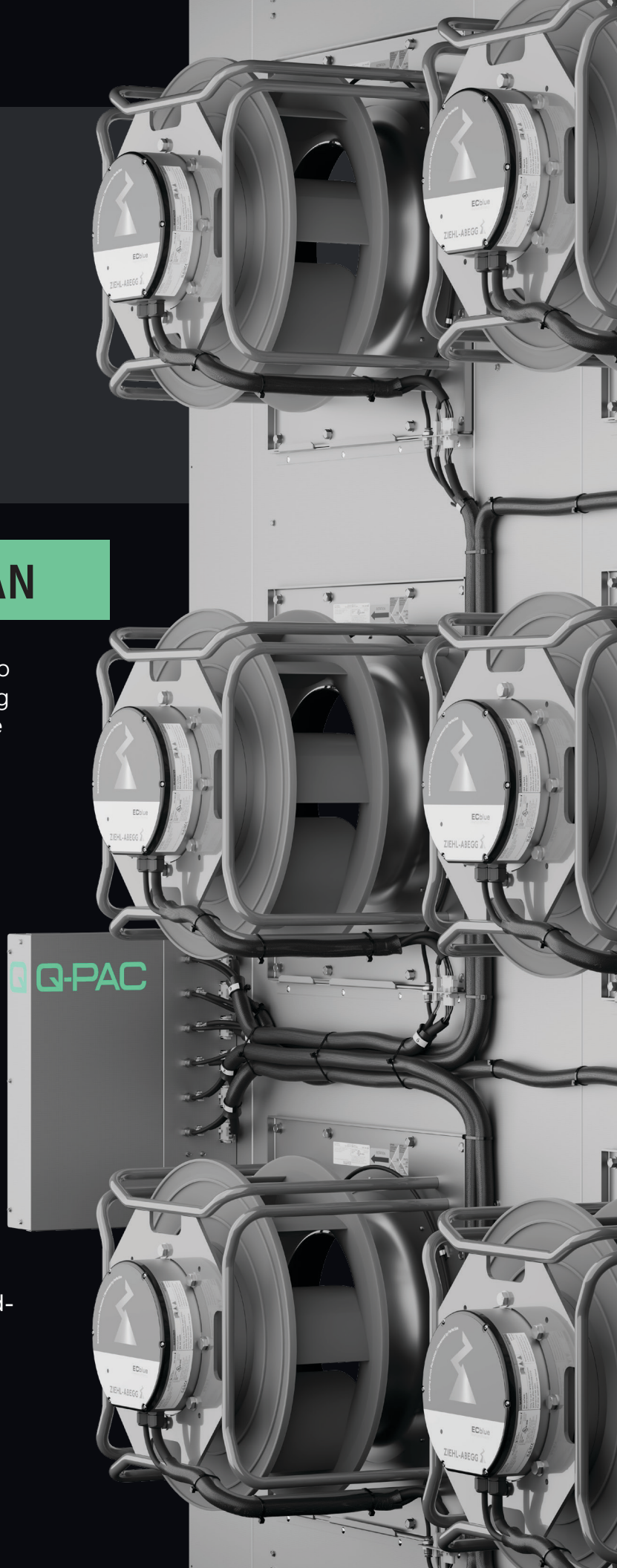
The Q-PAC Fan is designed to integrate easily into new and existing HVAC systems without requiring a dedicated control panel. Power and control are routed through the Q-PAC Fan Controller, which supports multiple communication options:

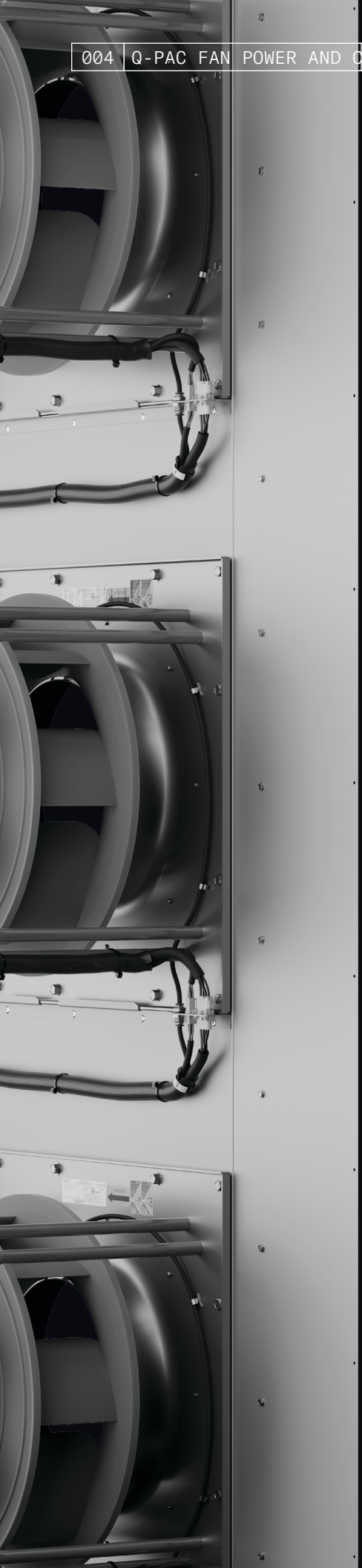
- 0–10VDC analog signal (basic operation)
- Modbus RTU (field-ready protocol)
- BACnet IP (in development)

For basic control, all that is required is a 0–10V signal and 3-phase power wired directly to the Fan Controller. This makes the Q-PAC Fan especially useful in retrofit or fan replacement applications where direct integration with an existing control panel or VFD may be needed.

While the Q-PAC Control Panel is required to access advanced control features and automation, the Fan Controller can operate independently and connect directly to most third-party systems.

Refer to the Fan Controller wiring diagram and terminal descriptions on Page 21 for connection details.





## Q-PAC FAN CONTROL OPTIONS

Future firmware updates will expand feedback and control capabilities, allowing existing Q-PAC Fans to be upgraded without replacing the fan or Fan Controller hardware. This ensures systems stay current as new features become available.

See the table below for currently supported control options.

| | |
|---|---|
| **ANALOG** | 0-10V signal for speed modulation only.<br><br>Serves as override control in case of Fan Controller Board malfunction. |
| **MODBUS RTU** | BMS integration for fan alarms and basic feedback and controls over Modbus:<br><br>■ Calculated total airflow<br>■ Individual motor status<br>■ Current control mode<br>■ Fan alarm code and status<br>■ Remote server ID<br><br>Also requires 0-10V analog signal for speed modulation. |

# EXTERNAL DISCONNECT AND CONTROL OPTIONS

While the Q-PAC Fan does not require an external control panel, NEC 430.102(B) requires a local disconnect when no panel is present. In many cases, especially retrofits or equipment rooms, additional local control may be needed beyond a basic disconnect switch.

To meet these needs, Q-PAC offers a range of control solutions designed specifically for use with the Q-PAC Fan. These options provide safe, code-compliant operation and simplify connection in the field.

Q-PAC offers three local control options:

- Basic Control Panel: Simplified local control and disconnect
- Premium Control Panel:  Advanced local control with override functionality
- Fused Disconnect (Schneider): Third-party UL-listed fused disconnect switch

Both the Premium and Basic Q-PAC Control Panels install outside the airstream and streamline power and control wiring and support up to four Q-PAC Fans per panel.

All panels are available in:

- 200–240V or 440–480V, 3-phase, 60Hz
- Type 1 (indoor) or Type 4 (outdoor) enclosures
- UL 508A certified

The Q-PAC Fan can also be integrated with third-party control panels. In many retrofit applications, this allows the fan to operate using the site's established control infrastructure. While advanced feedback and control options require a Q-PAC Control Panel or Modbus/BACnet integration with the fan, basic functionality can be achieved through standard analog connections.

# BASIC CONTROL PANEL

The Basic Control Panel provides streamlined connections to the Q-PAC Fan as well as local, manual control of the fan as may be needed for troubleshooting system issues.

The following features are standard in both Basic and Premium Control Panels.

| | |
|---|---|
| **DISCONNECT SWITCH** | External, padlockable rotary handle connected to a fused switch-disconnect. Provides a clear and safe means of isolating power during service or emergency shutoff. Required for NEC 430.102(B) compliance. |
| **SHORT CIRCUIT CURRENT PROTECTION** | All Q-PAC Control Panels are rated to 100 kAIC for short-circuit current protection, ensuring safety in high-fault environments. |
| **FUSED PROTECTION** | Panels use Class J current-limiting fuses to protect internal components and downstream equipment. |
| **SAFETY CIRCUIT INPUT** | A dry-contact input is provided for safety interlocks, compatible with fire alarms, smoke detectors, and other emergency shutdown systems. Disconnects fan operation when triggered. |
| **SPEED POTENTIOMETER** | A dial-style control that adjusts fan speed when in HAND mode. Allows manual speed tuning without external control signals. |
| **HAND \| OFF \| AUTO (HOA) SWITCH** | A 3-position switch allowing users to toggle between three modes: HAND (manual operation), AUTO (automatic operation), and OFF (Shutoff). |

# PREMIUM CONTROL PANEL

The Premium Control Panel offers the same features as the Basic Panel, with the following additions:

**BACnet MS/TP AND IP COMMUNICATION**

Supports common BACnet protocols for easy integration with building automation systems. Provides control and feedback for fan speed, power draw, airflow, and static pressure, along with alarm monitoring and override functions

**AUTOMATED CONTROL**

Two selectable options for automated system operation:

- CONSTANT AIRFLOW MODE: Adjusts motor speeds to maintain a fixed CFM setpoint.
- CONSTANT STATIC PRESSURE MODE: Modulates fan speed to hold a target static pressure.

**POWER AND AIRFLOW MONITORING**

Built-in sensors measure real-time power usage and fan airflow, enabling smarter control and system optimization. Helps verify performance, diagnose system issues, and improve energy efficiency.

**INTERLOCK CONTROLS**

Includes configurable dry-contact interlock inputs for safety and shutdown integration.

**DIGITAL TOUCHSCREEN DISPLAY**

Provides local access to fan data, control settings, alarms, and override options for onsite configuration and monitoring.

# FUSED DISCONNECT

Q-PAC offers Schneider's VisiPacT heavy-duty fused safety switch as an alternative to the Control Panels, providing a reliable way to meet NEC's disconnect requirement. The switch is tested per UL 98 and NEMA KS1 standards and is listed under UL files E2875 and E154828.


| | |
|---|---|
| **ENCLOSURE RATING** | Available in NEMA 1 and 3R |
| **FUSED OVERLOAD PROTECTION** | Uses heavy-duty fuses to protect the fan system from short circuits and overload conditions, ensuring safe operation under high fault conditions. |
| **VIEWING WINDOW** | Allows visual confirmation of fuse status without opening the enclosure, simplifying inspections and troubleshooting. |
| **DUAL COVER INTERLOCK** | Prevents access to live parts when the switch is energized. Both door and handle interlocks must be released for internal access, adding a layer of protection during maintenance. |
| **QUICK MAKE/ BREAK OPERATING MECHANISM** | Provides a fast, positive switching action for reliable power isolation, minimizing arcing and increasing operator safety. |

# EXISTING VFD OR CONTROL PANEL

When replacing a fan and its connected VFD or control panel, reusing the existing power supply wiring is often the simplest and most cost-effective option. This eliminates the need for new conduit runs and reduces install time. Always confirm that the wire size meets the minimum circuit ampacity (MCA) required for the new fan setup.

### WHAT IS MCA?

MCA stands for Minimum Circuit Ampacity. It's the minimum amperage rating the supply wiring must handle to safely carry the fan's electrical load under maximum operating conditions.

When replacing a fan, make sure the existing wire size meets the MCA of the new Q-PAC Fan. Undersized wiring can cause overheating, tripping, or safety issues. Matching MCA ensures safe, reliable operation—especially when reusing power wires from a previous VFD or panel.

Before installation, a power quality assessment is strongly recommended, especially in retrofit projects, to check for harmonics or other power irregularities that could affect fan performance.

### CAUTION WHEN CONNECTING TO EXISTING VFDS

If connecting to an existing VFD:

- Remove the VFD entirely. EC motors require clean, unmodified power and cannot accept the variable waveform output from a VFD. Supplying power through the VFD will cause the fan to fault.
- If the VFD includes a true bypass mode that supplies full, uninterrupted line voltage, it may remain in place and be used as a disconnect only.

# POWER HARMONICS

For reliable electrical system performance, it is important to minimize harmonic resonance and distortion. In buildings with many nonlinear loads, harmonic resonance can occur when noise from multiple devices overlaps. This may lead to distortion currents that accumulate at supply transformers and cause voltage distortion.

Q-PAC follows the IEEE-519 guidelines for harmonic limits. For systems under 1 kV, distortion at the point of common coupling (PCC) should stay below 7.5 percent individual and 12 percent total harmonic distortion, based on the 99th percentile short-time weekly average.

Q-PAC Fans use motors from multiple manufacturers, some of which include built-in features to limit harmonic distortion. These range from power factor correction (PFC) to active and passive filtering.

If you are unsure about harmonics in your system or need help evaluating risk, contact Q-PAC Support for assistance.

## COMMON SIGNS OF HARMONIC ISSUES

- Unexpected tripping of breakers or blown fuses
- Overheating of motors, wiring, or other electrical components
- EMI (electromagnetic interference) affecting control or data signals
- Higher utility bills and operating costs
- Reduced power capacity from supply transformers

# SELECTING A CONTROL OPTION

The Q-PAC Fan can be ordered on its own or with an external control panel or disconnect, giving you flexibility to match your system needs. Since the fan doesn't require a Q-PAC Control Panel to operate, panels and disconnects can also be added later to expand functionality or meet code requirements.

| | Q-PAC FAN ONLY[1] | FUSED DISCONNECT | BASIC CONTROL PANEL | PREMIUM CONTROL PANEL |
|---|---|---|---|---|
| DISCONNECT SWITCH | | ■ | ■ | ■ |
| LOCAL SPEED CONTROL | | | ■ | ■ |
| ANALOG AIRFLOW REPORTING | ■ | ■ | ■ | ■ |
| MODBUS COMMUNICATION | ■ | ■ | | |
| HAND / OFF / AUTO SWITCH | | | ■ | ■ |
| BACnet MS/TP OR IP | | | | ■ |
| DIGITAL TOUCHSCREEN DISPLAY (HMI) | | | | ■ |
| SAFETY CIRCUIT (BASIC PROTECTION) | | | ■ | ■ |
| SAFETY INTERLOCK (ADVANCED PROTECTION) | | | | ■ |
| FIREMAN OVERRIDE | | | | ■ |
| START/STOP | | | ■ | ■ |
| FAN STATUS RELAY | ■ | ■ | ■ | ■ |
| POWER CONSUMPTION REPORTING | | | | ■ |
| AUTOMATED CONTROL MODES (CONSTANT AIRFLOW / STATIC PRESSURE) | | | | ■ |
| INDIVIDUAL MOTOR STATUS REPORTING | ■ | ■ | | ■ |

[1] "Q-PAC Fan Only" refers to systems where the Q-PAC Fan is connected directly to a BMS, third-party control panel, or VFD. Values shown reflect data available via analog or Modbus communication. See Page 47 for details on supported control and feedback options.

# CONTROLS
# COMMISSIONING

Commissioning the Q-PAC Fan is simple and designed for minimal setup. Every order includes supporting documents to guide the process:

- **WIRING GUIDE** Quick reference document for connecting power and controls to the Q-PAC Fan, Control Panel, or fused disconnect.
- **USER MANUAL** Detailed documentation covering wiring, interfaces, Modbus and BACnet communication, electrical ratings, maintenance, and more. Content is specific to the accessories included with your order.

## COMMISSIONING THE Q-PAC FAN (ONLY):

1. Disconnect power at the supply.
2. Connect three-phase power (plus ground) and a 0–10V signal to the Fan Controller.

This is all that's required for analog-only setups. The Fan Controller will automatically detect the motors. You can then perform a bump test to verify operation

## COMMISSIONING SYSTEMS WITH MODBUS COMMUNICATION:

3. Wire CN5 and CN6 on the Fan Controller Board to the Digital In/Out terminals on the Control Panel.
4. Configure Modbus objects in the BMS.
5. Perform a bump test to confirm operation.

## COMMISSIONING SYSTEMS WITH BACNET MS/TP OR BACNET IP (PREMIUM CONTROL PANEL)

3. **For MS/TP:** Connect CN5 (+, –, GND) to the BACnet MS/TP terminals on the Control Panel.
   **For BACnet IP:** Use the Ethernet port instead of the RS-485 terminals.
4. Discover BACnet devices and locate the Q-PAC Fan.
5. Use Multistate Value 0 (CONTROL TYPE) to set control mode to "BACnet."
6. Use Analog Value 0 (FAN SPEED) to set fan speed (0–100%).
7. Configure any additional BACnet objects in the BMS.
8. Perform a bump test to confirm operation.

# CERTIFICATIONS & COMPLIANCE

The Q-PAC Fan is built for more than airflow. It is built for code compliance, operational safety, and long-term reliability. Every component, from the Fan Frame to the electronics, is engineered to meet the demands of commercial comfort-cooling environments while aligning with key industry standards for electrical, mechanical, and environmental safety.

Q-PAC is committed to meeting and exceeding industry standards for certification and performance. As part of that commitment, Q-PAC has joined AMCA International and built a state-of-the-art, AMCA 270-compliant airflow tunnel. This facility meets rigorous testing standards and advances the accuracy and reliability of airflow measurements for multimotor plenum fans.

The Q-PAC Fan, system components, and accessories are tested and certified to comply with the following standards:

## Q-PAC MULTIMOTOR PLENUM FAN

RECOGNIZED COMPONENT
ETL LISTED C US
Intertek

### UL 60335-2-40 RECOGNIZED

Household and Similar Electrical Appliances - Safety - Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers

This safety recognition covers electrically powered HVAC equipment with integrated fan motors and controls, such as the Q-PAC Fan. It ensures the system meets modern safety requirements for commercial comfort-cooling and simplifies integration into certified air handlers.

SEISMIC COMPLIANCE PRE GO-PRE.COM

### OSHPD CERTIFIED PER ICC-ES AC156

AC156 Seismic Certification by Shake-Table Testing of Nonstructural Components

This ensures the fan can be safely used in OSHPD-regulated facilities and other critical environments requiring seismic compliance.

SDS = 2 . 50g for Rμ = 1.0, Hf = 1.0 (Ground)
SDS = 1 . 61g for Rμ = 1.3, Hf = 3.5 (Roof)

## Q-PAC FAN CONTROLLER

### UL 60730-2-15 RECOGNIZED

Automatic Electrical Controls - Part 2-15: Particular Requirements for Automatic Electrical Air Flow, Water Flow and Water Level Sensing Controls

This safety recognition applies to automatic electronic controls used in HVAC equipment, including fan speed controllers like the Q-PAC Fan Controller. It ensures safe, reliable operation in building systems and supports integration into certified air handling units.

### FCC TITLE 47

Code of Federal Regulations Title 47 - Part 15: Radio Frequency Devices

The Q-PAC Fan Controller meets U.S. standards for electromagnetic compatibility, ensuring it won't interfere with other electronics and is protected against outside interference. This supports reliable performance in commercial buildings and integration with other control systems.

## Q-PAC CONTROL PANELS

### UL 508A LISTED PER UL TESTING

Standard for Industrial Control Panels

Q-PAC Control Panels are built to meet U.S. safety standards for industrial control equipment. This ensures safe operation, proper circuit protection, and reliable performance in commercial HVAC installations.

## FUSED DISCONNECT

The Schneider fused disconnect supplied by Q-PAC is tested to UL98 and NEMA KS1 standards and is listed under UL files E2875 and E154828, ensuring safe, code-compliant power isolation for commercial HVAC installations.

# SENSORS & SYSTEM COMMUNICATION

The Q-PAC Fan includes built-in sensors that monitor airflow, motor status, and fan alarms, enabling safe and efficient operation without external sensors in most cases. Additional features such as power monitoring and advanced control modes are available when connected to a Q-PAC Premium Control Panel or integrated via standard protocols like Modbus or BACnet.

The table below summarizes which features are accessible to the Building Management System (BMS) based on system configuration.

| | | | |
|---|---|---|---|
| Q-PAC FAN ONLY | ANALOG | ■ Fan airflow[1] [AO1+ / AO1–]<br>■ Fan alarm status—Fan Alarm Relay [K1A, K1B, K1C] | |
| | MODBUS | ■ Fan airflow<br>■ Fan alarm status<br>■ Fan speed | ■ Individual motor status<br>■ Control mode |
| Q-PAC FAN & PREMIUM CONTROL PANEL | BACNET | ■ Fan airflow (total)<br>■ Fan speed<br>■ Local duct pressure<br>■ Constant Airflow control and setpoint[2]<br>■ Constant Static Pressure control and setpoint[3] | ■ Power consumption<br>■ Current measurement<br>■ Individual motor status<br>■ Interlock toggle/status<br>■ Fireman override status<br>■ Start/Stop<br>■ System run |

1 **Fan airflow** is calculated using the differential pressure across each inlet cone, summed and scaled to a 0–10V signal representing total airflow. Reference values for interpreting this signal are provided in the User Manual.

2 **The Constant Airflow control method** automatically adjusts motor speed to maintain airflow, even if a motor fails. For best performance, a separate static pressure sensor (not included) is recommended when using this mode.

2 **The Constant Static Pressure control method** automatically adjusts motor speed to maintain a set static pressure, even if a motor fails. This control method requires a separate static pressure sensor (not included).

# Q-PAC

A SMARTER FAN FOR COMMERCIAL AIRFLOW