

# PHOENIX

PRECISION BALANCED

*DUAL  
Zone*

# INSTALLATION & OPERATION MANUAL

PRECISION BALANCED  
SINGLE TO THREE PHASE CONVERTER



**WARNING**  
HIGH VOLTAGE  
DISCONNECT POWER  
BEFORE SERVICING

**BUILT TO PERFORM. ENGINEERED TO LAST.**

Thank you for choosing Phoenix Precision Balanced.  
Please read this manual completely before installation  
and operation.

# Mounting and Location



## Mounting and Location

The phase converter panel must be mounted securely on a solid wall or structure, with the idler motors positioned on a stable, level surface.

Adequate clearance must be provided around the panel and motors for ventilation, wiring access, inspection, and service.

The installation area should be dry, protected, and free of obstructions.

## Service Size and Breaker Sizes

Service size, wire size, and breaker sizing must be selected according to the model requirements, input voltage, and load conditions.

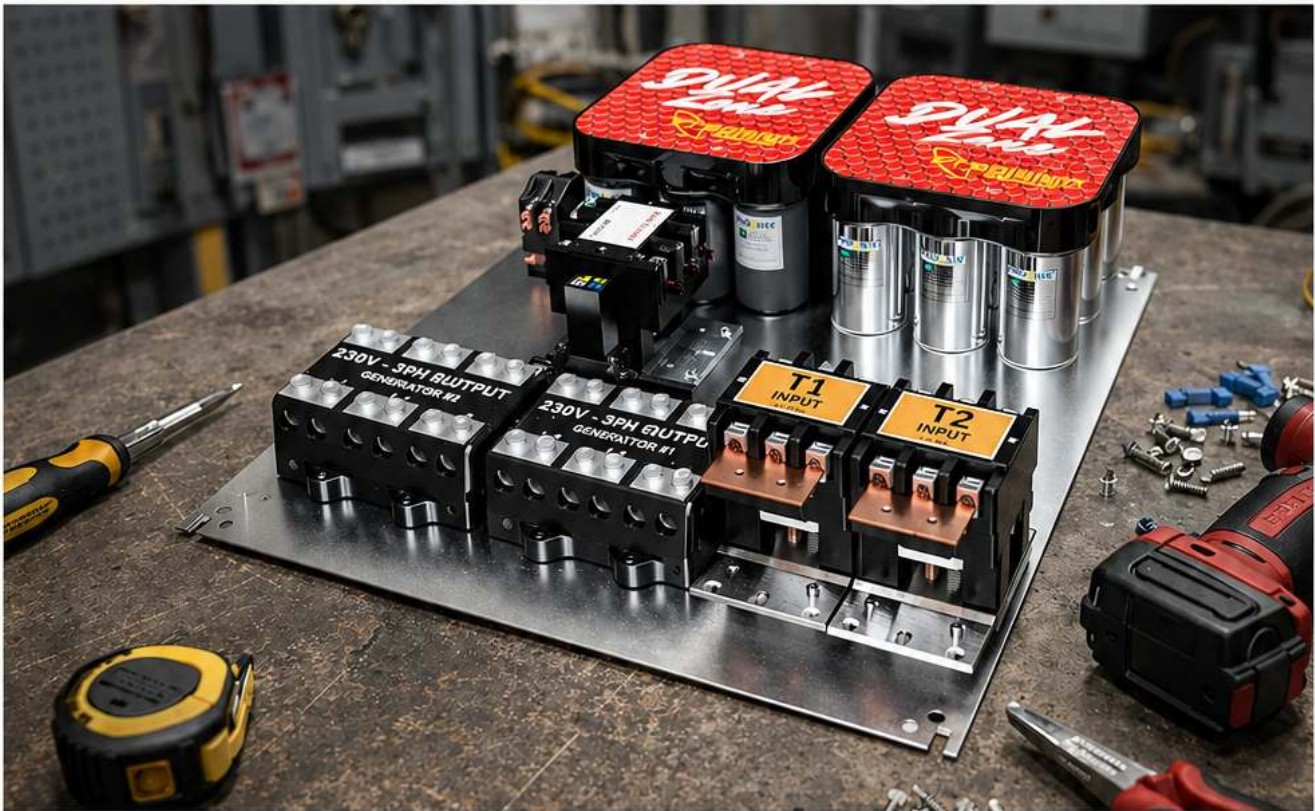
The installer must follow the wire size chart and breaker recommendations provided in the manual or inside the panel.

All final sizing and overcurrent protection must be verified by a qualified licensed electrician before energizing the unit.



**IMPORTANT:** Installation, service sizing, and breaker selection must be performed by a qualified licensed electrician. Verify all wiring, grounding, and breaker sizes before startup.





# GETTING STARTED

Thank you for choosing a Phoenix Phase Converter.

Before installing your unit, review the layout below and the instructions in this manual. Identify all connection points and the wire size chart inside the panel before making any wiring connections.

This manual will guide you through the installation, wiring, and start-up of your phase converter to ensure safe and reliable operation.



### READ THIS MANUAL

Read this manual completely before installing or operating the unit. Keep this manual for future reference.

### IN THIS MANUAL YOU WILL FIND:



Single-Phase Input Power Connection



Idler/Generator Motor Connection



Three-Phase Output/Load Connection



Wire and Breaker Sizing



Start-Up and Operation



Safety Precautions and Checks



**IMPORTANT:** Installation must be performed by a qualified, licensed electrician.

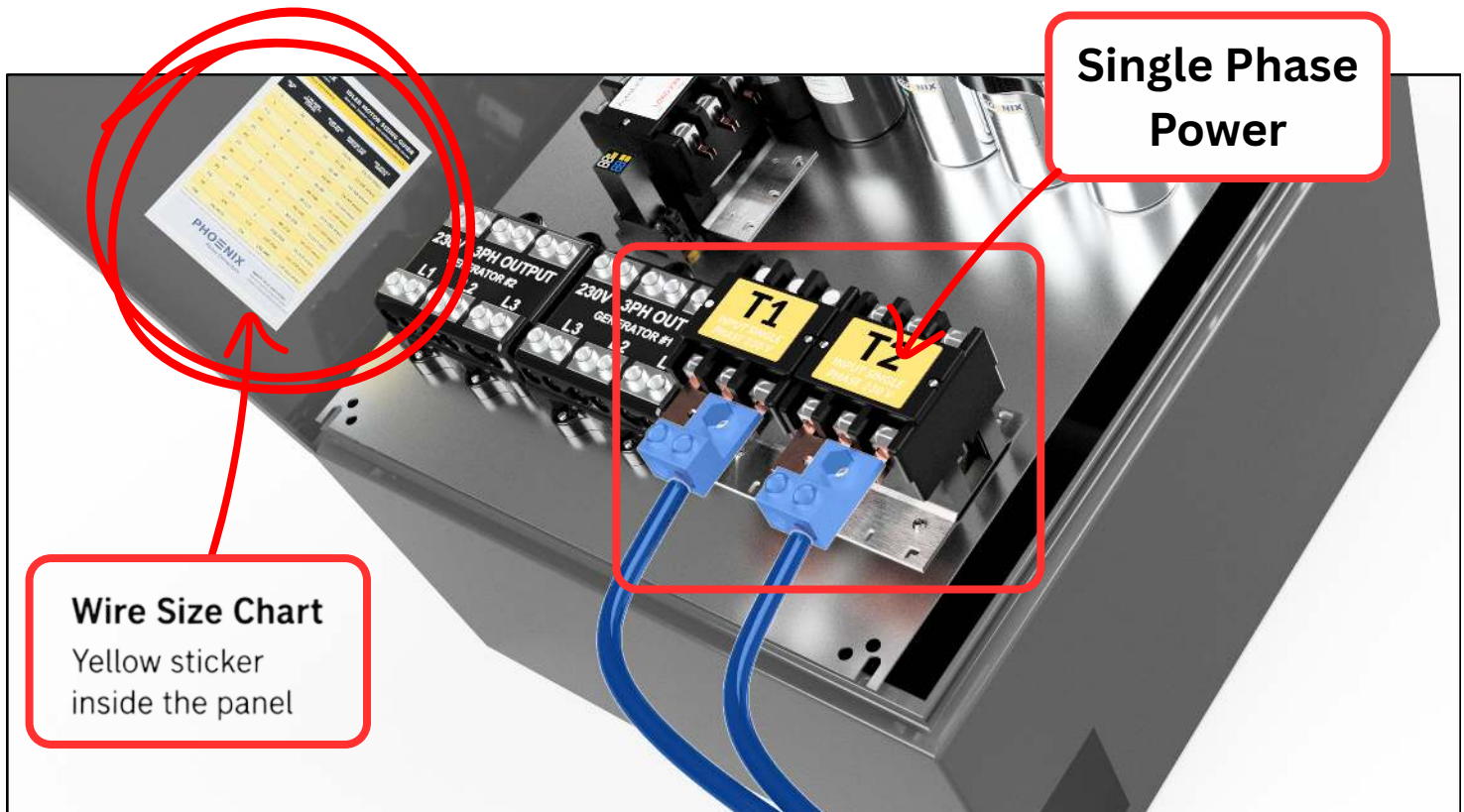
Disconnect and lock out all power sources before installing or servicing this equipment. Failure to follow safety instructions can result in serious injury or equipment damage.

**NEED HELP?** Contact your authorized Phoenix Phase Converter dealer or visit [www.phoenixphaseconverters.com](http://www.phoenixphaseconverters.com)

**PHOENIX**  
PHASE CONVERTERS

## Dual Zone 230V Series - SINGLE PHASE CONNECTION

Dual Zone must be taught as a sequence, not just a spec table. Each zone needs labels, photos, startup order, and a support handoff that shows both idlers and the panel connections.



### Single-Phase Line Connection

Connect the incoming single-phase power line to terminals **T1** and **T2**.

Use **bolt-down lugs** and properly sized wire for the installation. Refer to the wire size chart for the correct wire gauge. The wire size chart is based on a maximum wire run of **50 feet**.

It is recommended to keep the single-phase line as short as possible. If the wire run exceeds **50 feet**, increase the wire size by **one gauge size for every additional 50 feet** of distance.

All wiring should be installed in accordance with applicable electrical codes and performed by a qualified electrician.

**IMPORTANT:** Verify utility transformer size, service capacity, breaker/fuse rating, and wire size before installation. Undersized supply equipment may cause low voltage, overheating, equipment damage, or failure to start. Installation must be performed by a qualified electrician.

# Single-Phase Input Power for Smaller Units

On smaller units, the incoming single-phase power connects to T1 and T2.

Connect the two incoming single-phase power wires to the terminals marked:

**T1** Input Single Phase 230V

**T2** Input Single Phase 230V

**IMPORTANT:**  
On smaller units, connect incoming single-phase power **only** to T1 and T2.



**L1 L2 L3**  
**Do not connect incoming single-phase power to the generator output terminals.**  
Those terminals are for the three-phase output/load connections.

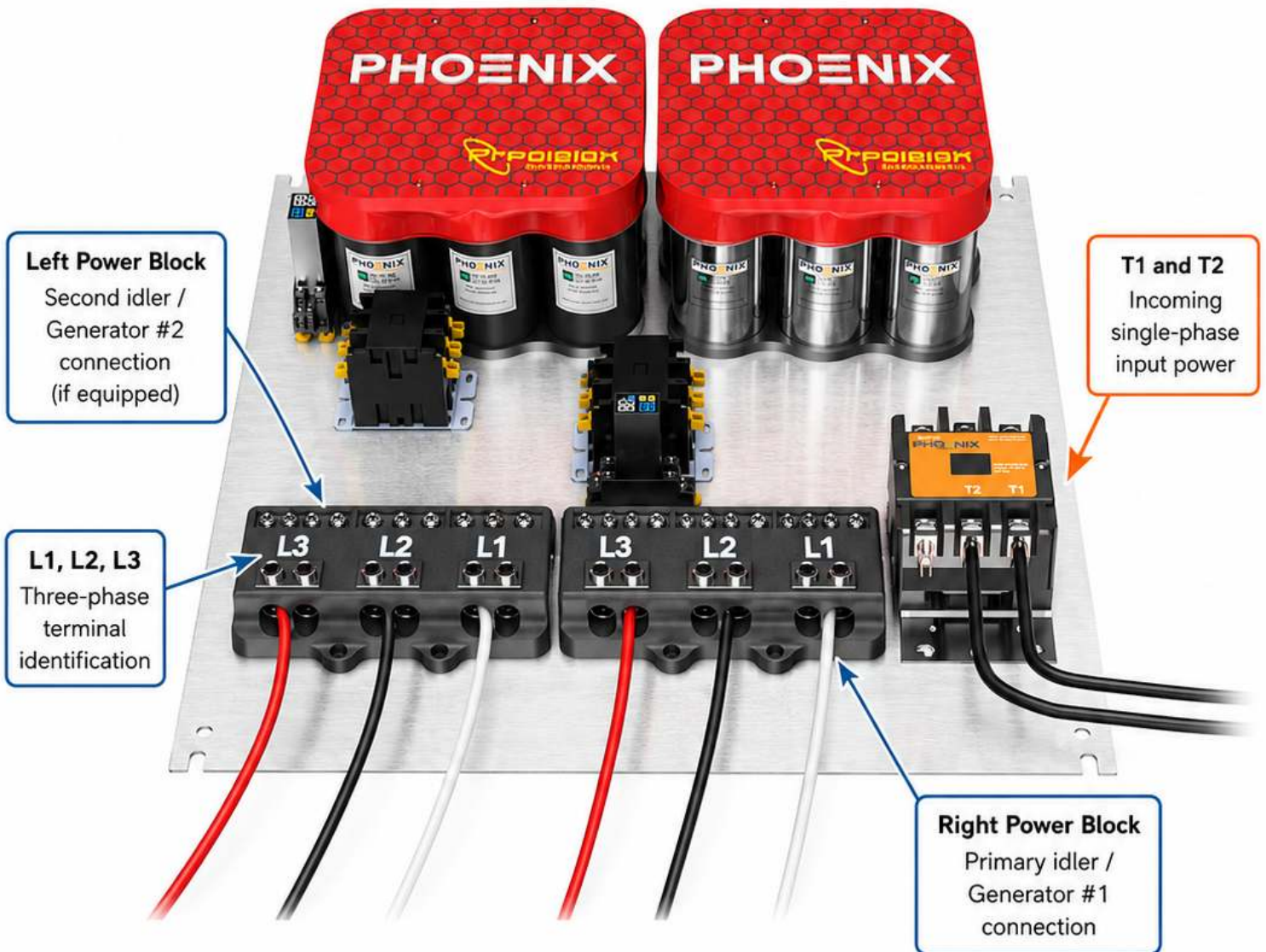
**BEFORE ENERGIZING:**

- Verify the input voltage is 230V single phase.
- Ensure all electrical connections are clean, secure, and properly tightened.
- Loose connections can cause overheating, voltage issues, or equipment damage.

For recommended wire and breaker sizes, refer to the wire size chart inside the panel or see Part #3PC60 in this manual.

# Panel Wiring Diagram for Smaller Units

This diagram shows the general panel wiring layout for smaller units. Use this page as a visual reference together with the detailed wiring instructions in this manual.



1. Connect incoming single-phase power to T1 and T2.
2. Connect the primary idler motor to the power block on the right.
3. If equipped, connect the second idler motor to the power block on the left.
4. Verify all wiring and voltage before energizing the unit.



**IMPORTANT:** Installation must be performed by a qualified, licensed electrician. Disconnect and lock out all power before installation or service.

# First Idler Motor Connection

Wire the first idler motor to the **power block on the right**.



## WIRE SIZE CHART

Located on the yellow sticker inside the panel.

# 1

This is the primary idler motor and will always be the first motor to start when the phase converter is engaged.



Follow the **wire size chart on the yellow sticker inside the panel**. Wire sizing shown on the chart is based on a wire run of **50 feet or shorter**.



Make sure all electrical connections are clean, secure, and properly tightened. Loose connections can cause overheating, voltage issues, nuisance breaker tripping, or equipment damage.



## IMPORTANT:

Verify wire size, breaker size, and terminal connections before energizing the unit. Installation must be performed by a qualified licensed electrician.

## Second Idler Motor Connection and Operation



**IMPORTANT:** The second idler motor connects to the **left power block**. **Do not energize or engage the second power block unless the second idler motor is connected.** Operating the second power block without the motor connected may cause improper operation or equipment damage.



A **green** disable button is located on the front of the unit. When the **green** button is **pressed**, the second idler motor is **engaged**.

There is normally no reason to disable the generator during operation. The green button may be left in the engaged position during normal use.



### SECOND IDLER MOTOR CONNECTION

Connect the second idler motor to the **left power block** as shown.



### NORMAL OPERATION:

- The green button should remain **pressed** (engaged) during normal use.
- There is normally no reason to disable the generator.



**WARNING:** Always ensure the second idler motor is connected before engaging the left power block. Failure to do so may result in equipment damage.

# Idler Motor Wiring

The idler/generator motor must be wired according to the wiring diagram located inside the motor conduit box or on the motor nameplate. Verify the correct voltage before making connections.

For standard **NL and PL models**, use the **230V low-voltage** connection. For **NH and PH models**, use the **460V high-voltage** connection.

### 12 Wire Motor For 230 Volts Only

12 LEAD MOTOR		
Yellow (1)	Black (2)	Red (3)
Blue (4)	White (5)	Orange (6)
Red (7)	Yellow (8)	Black (9)
White (10)	Orange (11)	Blue (12)

INSIDE CONDUIT BOX

L1 + T1, T12, T6, T7  
L2 + T2, T10, T4, T8  
L3 + T3, T11, T5, T9

- Connect 1, 6, 7, 12 together to L1
- Connect 2, 4, 8, 10 together to L2
- Connect 3, 5, 9, 11 together to L3

### 9 Wire Motor For 230 Volts Only

9 LEAD MOTOR		
Blue (1)	White (2)	Orange (3)
Yellow (4)	Black (5)	Red (6)
Blue (7)	White (8)	Orange (9)

INSIDE CONDUIT BOX

T6, T5, T4  
L1 + T7, T1  
L2 + T8, T2  
L3 + T3, T9

- Connect 1 & 7 together to L1
- Connect 2 & 8 together to L2
- Connect 3 & 9 together to L3
- 4, 5, and 6 together.

**IMPORTANT:** The wiring diagrams shown on this page are for 230V idler/generator motor connections only. 460V motor lead wiring is not shown here and is covered in the separate 460V high-voltage motor manual.

### RECOMMENDED LUGS FOR IDLER MOTOR CONNECTIONS

#### SPLIT BOLT CONNECTOR

- Secure mechanical splice connection
- Suitable for properly sized copper conductors
- Tighten to manufacturer specifications
- Insulate connection as required

EXAMPLE SHOWN

#### SCREW-DOWN LUG

- Reliable mechanical connection
- Available for various wire sizes
- Tighten set screws to proper torque
- Suitable for motor lead terminations

EXAMPLE SHOWN

#### POLARIS INSULATED CONNECTOR

- Pre-insulated for added safety
- Compact and easy to install
- Suitable for stranded copper conductors
- Tighten to manufacturer specifications

EXAMPLE SHOWN

!

**IMPORTANT:**

Do not use wire nuts for idler motor wiring connections. Use only split bolts, screw-down lugs, or Polaris-style insulated connectors. All connections must be tight, secure, and enclosed in an approved junction box.



# Before Testing

Before testing the phase converter, verify that the panel, conduit, and idler motors are installed correctly and that all wiring connections are complete, secure, and tightened properly. Confirm that the installation area is clear and safe before energizing the unit.



## Before Testing Checklist

- ✓ Verify incoming single-phase power is connected correctly.
- ✓ Verify the idler motor wiring is complete and matches the motor wiring diagram.
- ✓ Verify all power connections are tight and secure.
- ✓ Confirm the motors are mounted securely and able to rotate freely.
- ✓ Make sure the area around the motors and panel is clear of tools and debris.
- ✓ Do not energize the unit until all covers, wiring, and connections have been checked.



This page is intended as a visual pre-start inspection reference.



### IMPORTANT

Installation and testing must be performed by a qualified, licensed electrician. Disconnect and lock out all power before making wiring changes or servicing the unit.

# Dual Zone Wire Size & Breaker Size Chart

Use the chart below to determine the recommended service size, breaker size, and wire size for Dual Zone rotary phase converter models. All wiring must be sized and installed by a qualified licensed electrician in accordance with local electrical code.



**IMPORTANT**

Use MOTOR LOAD type breakers only. Standard (light-duty) breakers may nuisance trip due to high starting current.

Model	Total HP	Qty	Each HP	KVA	Service	Max Ind.	Max Res.	Min Brkr	Max Brkr	1PH Wire	Idler Wire	Panel Size
GP5/10L	10	2	5	9	10	30	15.5	10	60	8	10	20x12x10
GP7/15L	15	2	7.5	14	10	41	20.9	15	60	6	10	20x12x10
GP10/20L	20	2	10	19	15	52	25.8	20	100	6	8	20x12x10
GP15/30L	30	2	15	28.2	25	80	42.7	30	120	4	6	20x16x8
GP20/40L	40	2	20	37	30	104	50.2	40	150	4	6	20x16x8
GP25/50L	50	2	25	47	30	126	63.1	60	200	2	4	20x16x8
GP30/60L	60	2	30	56	50	160	84.5	60	200	3	3	20x20x8
GP40/80L	80	2	40	74	50	206	112.5	80	300	1	3	20x20x8
GP50/100L	100	2	50	94	75	250	148.9	80	350	1/0	2	24x24x8
GP60/120L	120	2	60	112	75	320	160	125	400	3/0	1/0	20x20x8 x
GP75/150L	150	2	75	140	100	448	225	125	500	4/0	1/0	24x24x8 x 2

**WIRE SIZING NOTES**

- Wire size is based on 75°C copper conductors with a maximum of 100 feet total run (one-way).
- For longer runs or aluminum conductors, increase wire size as required by code.
- All wiring must be sized in accordance with the National Electrical Code (NEC) and local requirements.
- Idler motor wire size is for the individual idler/generator motor feed.

**INSTALLATION NOTES**

- Installation must be performed by a qualified licensed electrician.
- Verify all connections are tight and secure.
- Verify the voltage before energizing the unit.
- Use proper strain relief and cable support.



**WARNING:**

Phase converters can draw high starting current. Use MOTOR LOAD type breakers only. Standard breakers may nuisance trip and cause downtime.



**IMPORTANT:**

Refer to the model wiring diagram for correct wiring of input, output, and idler motor connections.


All electrical work must comply with the National Electrical Code (NEC) and local codes.

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PHOENIX PHASE CONVERTERS

## Common Motor-Load Breaker Part Numbers

The table below lists common motor-load breaker part numbers used with rotary phase converter installations. These are reference only. Always verify compatibility with your panel, voltage, and application requirements.

Manufacturer	Breaker Series (Motor-Load)	1 Pole	2 Pole	3 Pole	Notes
 by Schneider Electric	QO™	QO1xxx	QO2xxx	QO3xxx	Standard QO series; use HACR or motor-rated as required by code.
	QP™	QP1xxx	QP2xxx	QP3xxx	Type QP circuit breakers; verify interrupt rating and panel listing.
 Powering Business Worldwide	BR™	BR115	BR215	BR315	BR Type breakers; suitable for motor-load applications.
	THQL®	THQL1115	THQL2115	THQL3115	THQL series; verify panel compatibility and voltage rating.
 by E.T.O.N	MP™	MP115	MP215	MP315	MP series; used in Murray / Eaton panelboards.
	THQL®	THQL1115	THQL2115	THQL3115	GE THQL series; confirm panel type and application.



**IMPORTANT:**

Breaker part numbers vary by amp rating, interrupt rating, voltage rating, and pole configuration. Always match the breaker to the service panel manufacturer and panel label. Do not install breakers that are not listed for use in the panel.

All electrical work must comply with the National Electrical Code (NEC) and local codes.

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# SUPPORT DECISION CARDS

Use these decision cards to quickly identify common issues and actions. Always follow safety procedures and the installation manual.



## WILL NOT START

Check disconnect, breaker, input voltage, control power, and start circuit. Check for voltage dropping while trying to start. Never leave the phase converter on for more than 2 seconds if it does not start.

- ✔ Verify main disconnect is ON.
- ✔ Verify breaker is ON and sized correctly.
- ✔ Verify input voltage matches nameplate.
- ✔ Check for voltage dropping while trying to start.
- ✔ Verify control power is present.
- ✔ Verify start circuit and connections.
- ✔ Never leave the converter energized for more than 2 seconds if it does not start.



## BREAKER TRIPS

Record breaker size/type, feeder distance, service details, and whether idler reaches speed.

- ✔ Verify motor-load type breaker is used.
- ✔ Verify breaker size is correct.
- ✔ Check for short circuits or ground faults.
- ✔ Check feeder wire size and distance.
- ✔ Verify idler motor reaches full speed.
- ✔ Inspect for overloading the converter.



## VOLTAGE ISSUE

Confirm meter placement phase-to-phase. Capture no-load and under-load readings.

- ✔ Verify meter is measuring phase-to-phase.
- ✔ Record no-load voltage on all three phases.
- ✔ Record under-load voltage on all three phases.
- ✔ Check for loose connections.
- ✔ Verify idler motor reaches full speed.
- ✔ Ensure load is balanced as possible.



## LOAD WILL NOT START

Separate converter startup from machine startup. Confirm machine voltage and controls.

- ✔ Start converter first. Let idler reach full speed.
- ✔ Measure voltage at machine terminals.
- ✔ Verify machine controls and wiring.
- ✔ Check for overload or locked rotor condition.
- ✔ Try reducing load and test again.
- ✔ Consult factory if issue persists.



## HIGH AMP READING

Explain generated-leg behavior and where to measure. Do not diagnose from one clamp reading.

- ✔ Measure amperage on all three output legs.
- ✔ Compare amperage on each leg.
- ✔ Check for unbalanced loads.
- ✔ Verify idler motor reaches full speed.
- ✔ Inspect for tight or damaged connections.
- ✔ Verify wire size and breaker size are correct.



## SUPPORT HANDOFF

Send model, order/serial, photos, readings, breaker/service info, and machine nameplate.

- ✔ Include converter model and serial number.
- ✔ Include photos of panel and connections.
- ✔ Include voltage and amperage readings.
- ✔ Include breaker size and service details.
- ✔ Include machine nameplate and load HP.
- ✔ Include a clear description of the issue.



### IMPORTANT:

Only qualified, licensed electricians should install, service, and troubleshoot this equipment. Disconnect and lock out all power before opening or working on the panel.

