Rosie 3-Phase Wiring and Configuration Instructions (10-607-1 Rev B)

Overview

These instructions guide you through wiring and configuring the MNROSIE7048RE Inverter/Charger ("Rosie") for 208VAC/3-Phase power. When three Rosie inverters are stacked together as a 3-Phase system, they function as a unified inverter/charger, with each individual Rosie inverter creating one of the phases (i.e., Phase A, B or C) of the 3-phase system.

WARNING: The information in these instructions is meant to supersede the AC stack wiring and stacking information provided in the MNROSIE7048RE Owner's Manual (PN: 10-432-1) and the MNE300ROSIE-240P Manual (PN: 10-562-1).

You must carefully read and follow all safety instructions and cautionary markings specified in the manuals listed above and in these instructions. An incorrect installation may result in the risk of electric shock, fire, or other safety hazard; and/or equipment damage.

Info: For 3-Phase stacking support, the Rosie inverter requires firmware version 24.10.22.3 or later, and the MNGP2 remote needs firmware version 24.10.16.00 or later.

3-Phase System Requirements

When connecting units as a 3-phase system, the following requirements must be met:

Info: The Rosie 3-Phase Breaker Boxes (PN's: MNE300ROSIE-120P3-Phase A, MNE300ROSIE-120F3-Phase B and MNE300ROSIE-120F3-Phase C) meet the requirements needed to stack Rosie inverters and are UL listed (US) and CSA certified (Canada) for a code compliant installation.

- A Rosie 3-Phase power system requires at least three Rosie inverters wired together and a MNGP2[1] remote to configure each one.
- The MNGP2[1] remote must be directly connected to the CAN connection of one of the Rosie inverters to communicate and synchronize for 3-phase operation. It is recommended that the MNGP2 be connected to the Primary (Phase A) inverter.
- Three communications cables—wired as a Cat5/Cat6 straight-thru/patch cable—should be connected in series to the CAN connectors: one is provided with the MNGP2 remote and each Follower Breaker Box (MNE300ROSIE-120F3-Phase B and MNE300ROSIE-120F3-Phase C) comes with one.
- Every inverter in the 3-Phase system must be connected to the same battery bank.
- The DC connection cables from the battery to each inverter must be of equal length and size.
- There must be a separate cable run from each inverters positive terminal to the battery bank through a DC Disconnect and overcurrent protection device (i.e., breaker). *Note: If you connect the cables together—other than at a Battery Combiner—and a cable fails, there is a possibility of pulling too much current through the remaining cables.*
- The inverters' negative terminals must be connected together, either at the inverters or at a location close to the inverters (within 18 inches/0.5 meters).
- The Rosie inverters should be no more than 6" (15 cm) from each other to allow the 6-foot communications cables to connect to each inverter, but allow at least 3" (7.6 cm) between, under, above, and in front of the inverter for ventilation purposes.
- The neutral outputs of all inverters are connected to the same neutral bus.
- The AC input to every inverter must be from the same 3-Phase source, and each phase (120 VAC leg) from that AC source into each inverter input must be 120° out-of-phase from each other.
- Each inverter must have appropriate AC and DC overcurrent protection.

Note 1: A MNGP2 remote is not required if a MidNite MNBCLNA or MNHAWKE'S BAY charge controller is also installed in the same system.

Removing the Top Cover

A Rosie 3-Phase power system requires at least three Rosie inverters wired together and an MNGP2 to configure each one. Before programming the MNGP2 remote for parallel operation, use the following steps to remove the Rosie's top cover and wire the inverters.

To gain access to the Rosie CAN connectors and wire the Rosie, you'll need to remove the top cover. This is a straightforward process: simply unscrew the ten 10-32 Phillips-head screws, as shown in Figure 1.
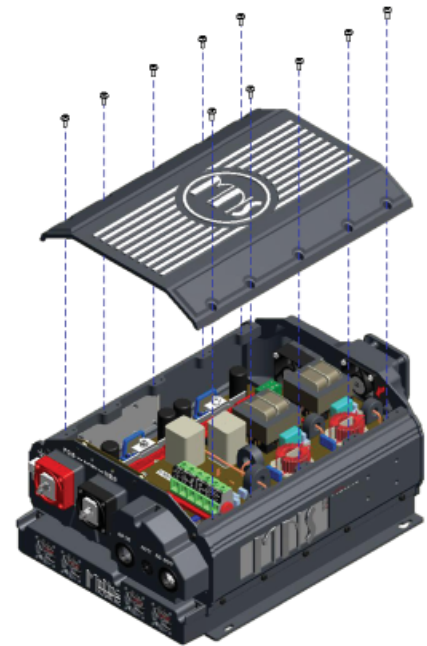

Figure 1, Removing the Top Cover

Moving the INV Jumper

Normally, the Rosie ships with the INV jumper set to ON, enabling it to automatically power up and supply 120/240VAC to the L1 and L2 outputs when battery power is applied. However, for a 3-Phase system, the L1 and L2 outputs on each 3-Phase inverter must be wired together, which would cause an inverter error—having a short on the output—when battery power is connected. To prevent the inverters from automatically turning on and causing this error, the INV jumper on each inverter must be temporarily moved from ON to OFF. See Figure 2 to locate the INV jumper, and move it to the OFF position.

Note: Keep the top cover off for now, as the INV jumper will need to be placed back to the ON position after each Rosie is configured for 3-Phase power.
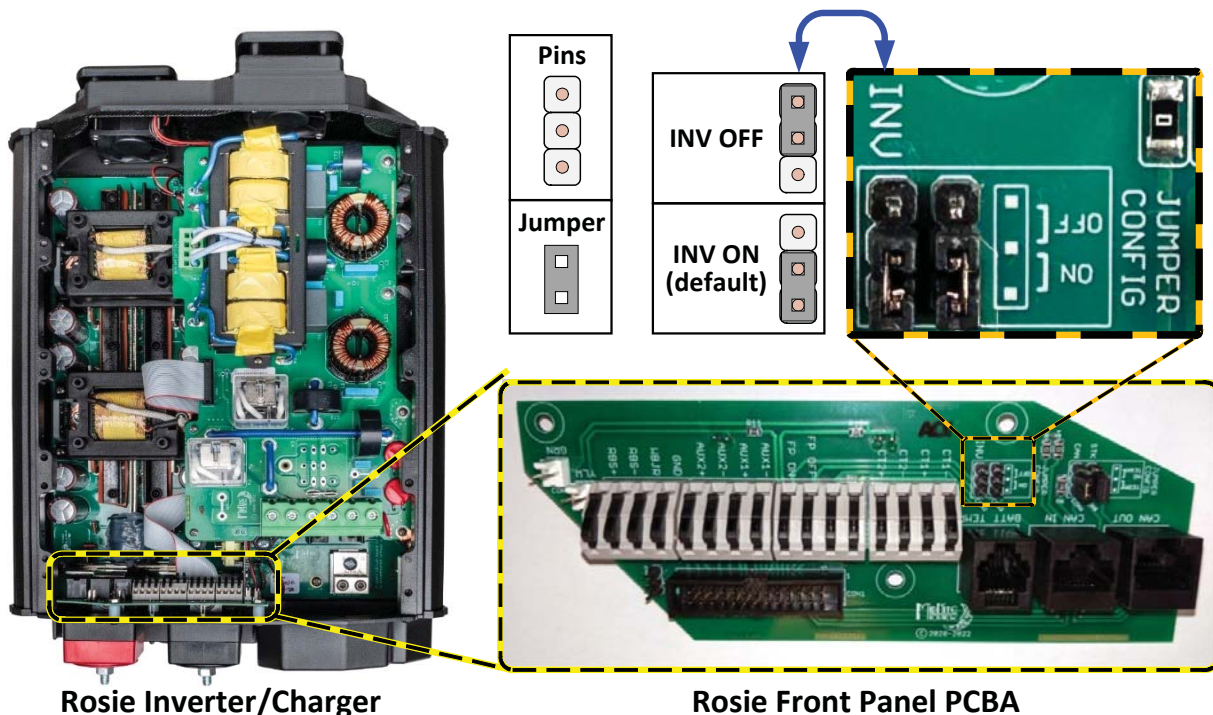

Rosie Inverter/Charger   **Rosie Front Panel PCBA**

Figure 2, Moving the INV Jumper

Rosie Communications

The MNGP2 remote and each Rosie inverter has two RJ45 connectors marked CAN IN and CAN OUT for ethernet cable connection. The ethernet cables, wired as a Cat5/Cat6 straight-thru/patch cable, allow multiple ROSIE inverters to communicate. The Rosie cable supports two separate network/bus sections: the CAN BUS section handles inverter/charger messaging, while the STK BUS section manages stacking messaging. Proper termination of each section is critical for maintaining signal/communication integrity, which is achieved by placing a termination resistor (i.e., Terminator) at the ends of each network/bus (see Figure 3).

IMPORTANT: As shown in Figure 3, terminators are only placed at the beginning and end of each network/bus. Ensure all devices between the beginning and end devices DO NOT have a terminator installed.
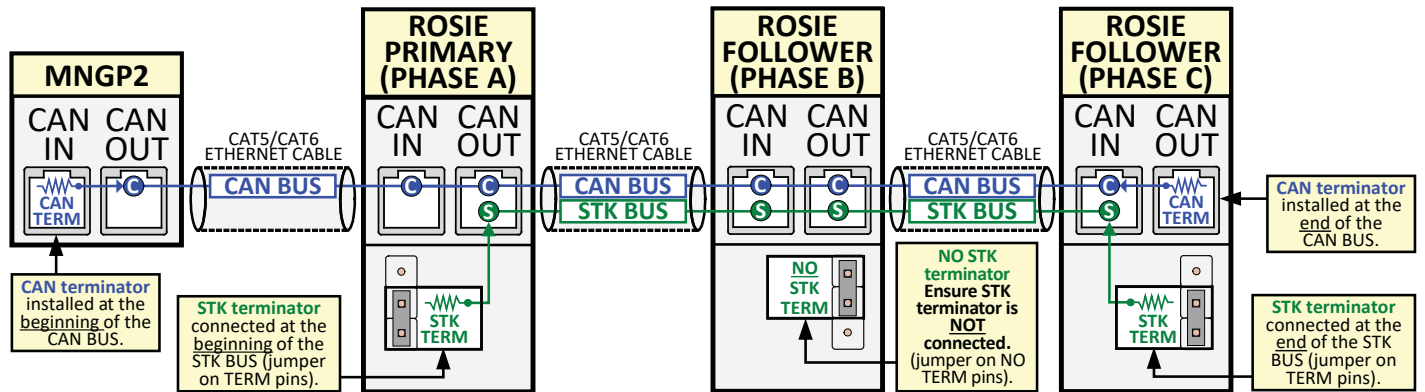

Figure 3, Properly Terminating the CAN and STK BUS Networks

Locating the CAN Connectors and the STK Terminating Jumper.

The Rosie inverter/charger has its two CAN connectors and the STK terminating jumper located inside, on the Front Panel PCBA as shown in Figure 4. While the top cover is off, it is recommended to check the jumper location to ensure the STK terminator is either connected (or not connected) as the installation requires.

Note: Normally the STK jumper is on the TERM pins (i.e., STK BUS is terminated) when shipped from MidNite.

Note: If using a BTS (Battery Temperature Sensor), its connector is also located on the Front Panel PCBA.
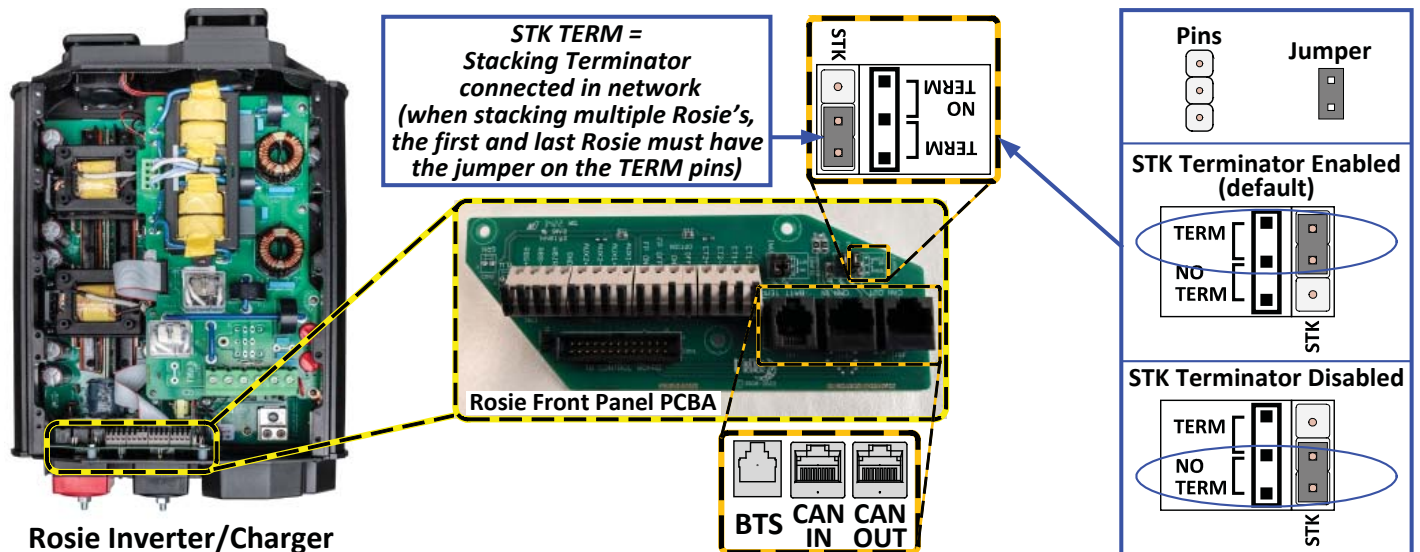

Figure 4, Locating the CAN Connectors and STK Terminating Jumper

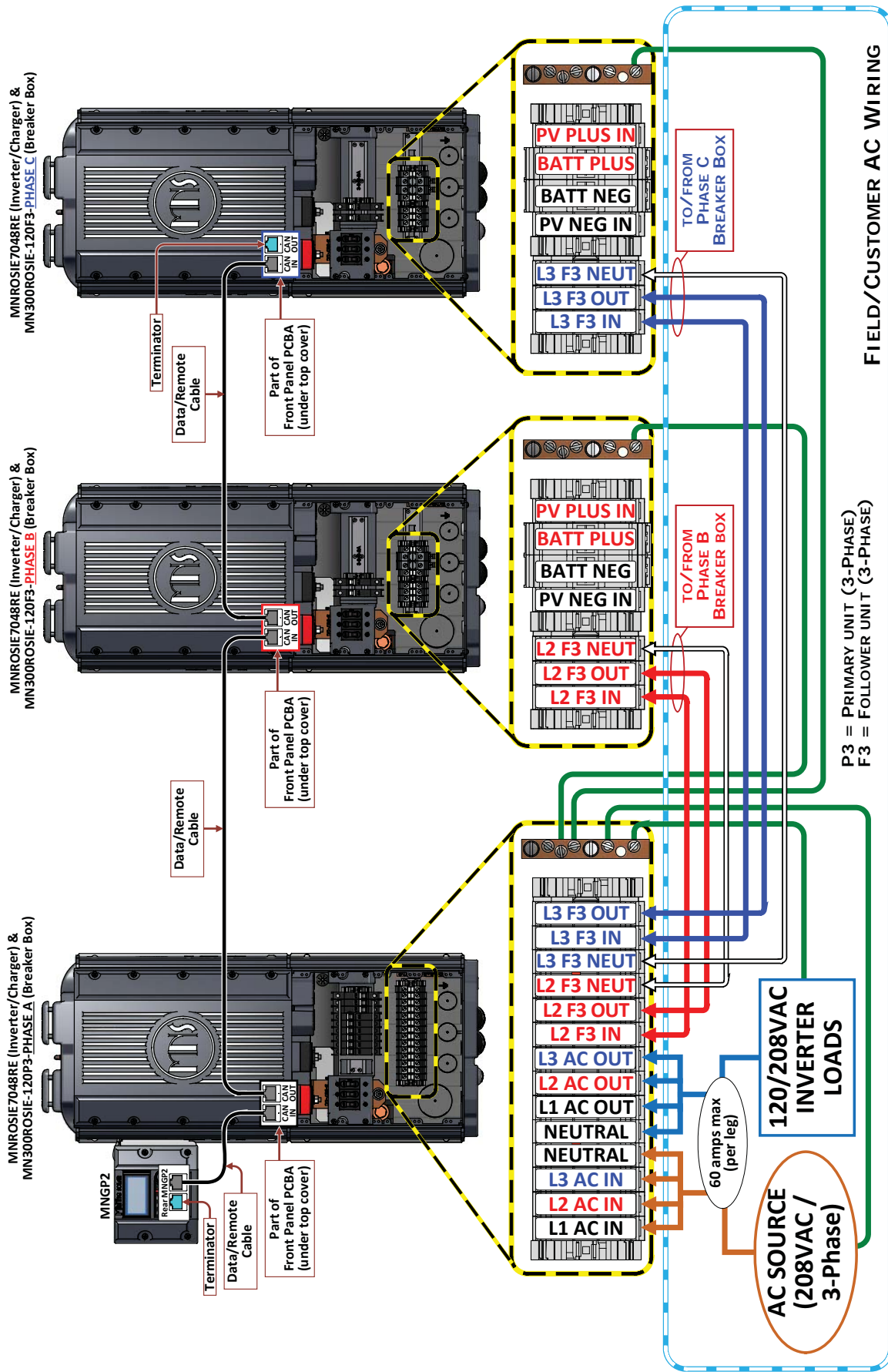# 3-Phase Wiring Diagram (AC and Communications)

Figure 5, AC Wiring (3-Phase Stacked Rosie Inverters)

3-Phase Stacking Diagram
(DC Wiring with Open-Loop Communications)

PRIMARY UNIT
(PHASE A)
MNROSIE7048RE (Inverter/Charger)
& MN300ROSIE-120P3 (Breaker Box)

FOLLOWER UNIT
(PHASE B)
MNROSIE7048RE (Inverter/Charger)
& MN300ROSIE-120F3 (Breaker Box)

FOLLOWER UNIT
(PHASE C)
MNROSIE7048RE (Inverter/Charger)
& MN300ROSIE-120F3 (Breaker Box)

MNGP2
(see Note 1)

Rear MNGP2

CAN
Terminator

Com Cable
(Cat5/Cat6)

No CAN
Terminator
installed
(only in first and
last CAN devices

CAN
Terminator

Com Cable
(Cat5/Cat6)

Com Cable
(Cat5/Cat6)

BTS CAN CAN
IN OUT

BTS CAN CAN
IN OUT

BTS CAN CAN
IN OUT

Shunt &
WhizBang Jr.

BATTERY COMBINER
(size based on charge
and discharge ampacity
of equipment/loads).
*Shown with shunt and
WhizBang Jr.*

BATTERY
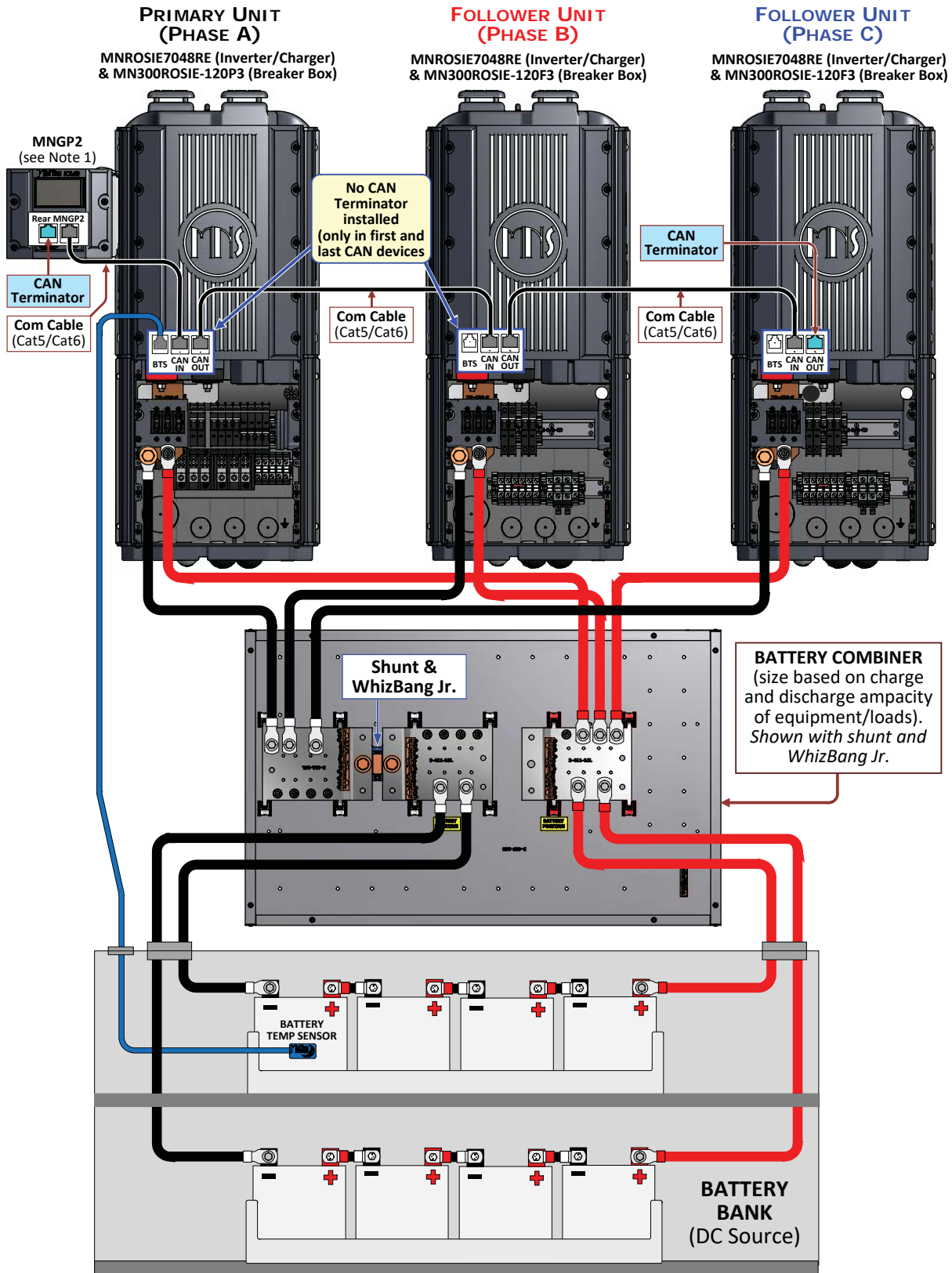TEMP SENSOR

BATTERY
BANK
(DC Source)

Figure 6, DC Wiring with Open-Loop Communications (3-Phase Stacked Rosie Inverters)

3-Phase Stacking Diagram
(DC Wiring with Open-Loop Communications)

PRIMARY UNIT
(PHASE A)
MNROSIE7048RE (Inverter/Charger)
& MN300ROSIE-120P3 (Breaker Box)

FOLLOWER UNIT
(PHASE B)
MNROSIE7048RE (Inverter/Charger)
& MN300ROSIE-120F3 (Breaker Box)

FOLLOWER UNIT
(PHASE C)
MNROSIE7048RE (Inverter/Charger)
& MN300ROSIE-120F3 (Breaker Box)

MNGP2
(see Note 1)

Rear MNGP2

No CAN Terminator installed (only in first and last CAN devices

CAN Terminator

Com Cable (Cat5/Cat6)

Com Cable (Cat5/Cat6)

Com Cable (Cat5/Cat6)

BTS CAN IN CAN OUT

BTS CAN IN CAN OUT

BTS CAN IN CAN OUT

BATTERY COMBINER
(size based on charge and discharge ampacity of equipment/loads).

2-Wire CAN Cable
(provided with MNPowerflo battery pack, see Note 2)

Link Cable

LINK IN   CAN   LINK OUT

MNPOWERFLO Battery Packs
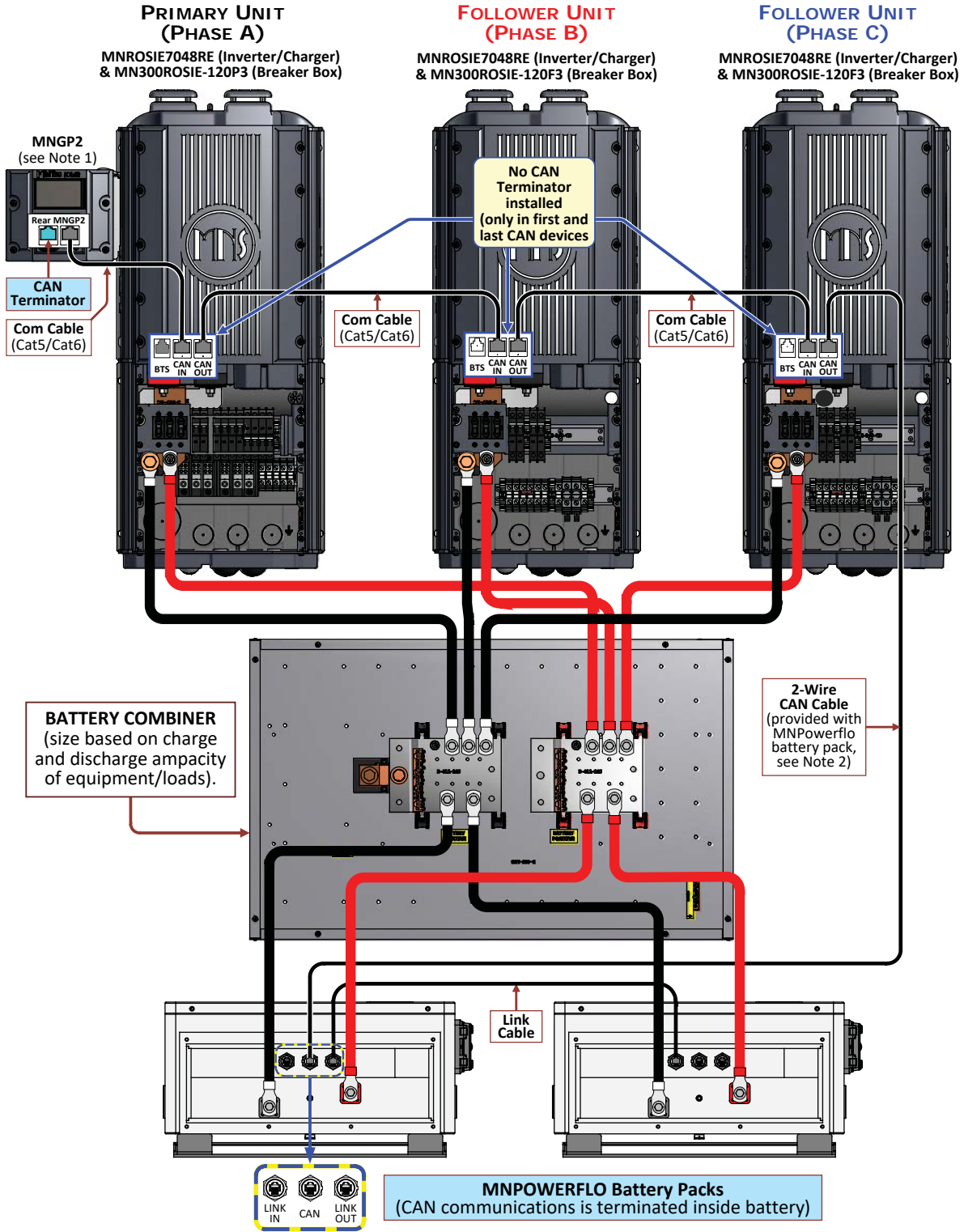(CAN communications is terminated inside battery)

Figure 7, DC Wiring with Closed-Loop Communications (3-Phase Stacked Rosie Inverters)

Note 1. A MNGP2 is not required if a MidNite MNBCLNA or MNHAWKE'S BAY charge controller is also installed in the same system.

Note 2. When using more than one Rosie and with close-loop communications (e.g. using MidNite's MNPowerFlo battery), the 2-wire communications cable that comes with the battery will need to be plugged into one of the Rosie's (preferably the last Rosie), and ensure a CAN terminator is not plugged into that Rosie. The MNPowerFlo battery will be used to terminate one end of the CAN network.

Configuring the MNGP2 for 3-Phase Operation

This section provides information about configuring the Rosie inverters with the MNGP2 remote for 3-Phase operation.

1. Set each Rosie INV jumper to the OFF Position.

2. Power up the system at the battery breaker.

3. Reset the system to defaults using the MNGP2 and configure the battery settings.

`User` + `System Functions` ⟩ `Set System to Defaults` ☞ `Set System to Defaults`

4. Set the topology to 120/120 60Hz in the System Config menu.

`Setup` + `System Config` ⟩ `Topology` ⟩ `Continue` ☞ `120/120 60Hz`

5. Name the inverters RosieA, RosieB, and RosieC, for L1, L2, and L3 respectively.

`Setup` + `Inverter Config` ⟩ `Inverter Specific` ⟩ `Rosie` ⟩ `Set Name`

6. You can use the aux output or the serial number to identify the units and phases.

`Setup` + `Inverter Config` ⟩ `Inverter Specific` ⟩ `Rosie` ⟩ `Firmware & Serial`

7. Set each inverter in the stacking menu to Leader + Phase A, Leader + Phase B, and Leader + Phase C.

`Setup` + `Inverter Config` ⟩ `Inverter Specific` ⟩ `RosieA` ⟩ `Stacking` ⟩ `Mode` ☞ `Leader`

`Setup` + `Inverter Config` ⟩ `Inverter Specific` ⟩ `RosieA` ⟩ `Stacking` ⟩ `Phase` ☞ `A`

`Setup` + `Inverter Config` ⟩ `Inverter Specific` ⟩ `RosieB` ⟩ `Stacking` ⟩ `Mode` ☞ `Leader`

`Setup` + `Inverter Config` ⟩ `Inverter Specific` ⟩ `RosieB` ⟩ `Stacking` ⟩ `Phase` ☞ `B`

`Setup` + `Inverter Config` ⟩ `Inverter Specific` ⟩ `RosieC` ⟩ `Stacking` ⟩ `Mode` ☞ `Leader`

`Setup` + `Inverter Config` ⟩ `Inverter Specific` ⟩ `RosieC` ⟩ `Stacking` ⟩ `Phase` ☞ `C`

8. Configure charger and breaker current, this value is per phase.

`Setup` + `Inverter Config` ⟩ `AC Input` ⟩ `Charge Rate`

`Setup` + `Inverter Config` ⟩ `AC Input` ⟩ `Breaker Size`

9. Verify and Power the 3-Phase system

a. With each Rosie now configured for a 3-Phase system, power down each unit by turning off the battery breaker and moving the INV jumpers back to the ON position.

b. Power up the system by turning on all three Rosie battery breakers and verify that all three inverters activate simultaneously.

c. Connect 3-Phase power to the three Rosie inputs (a single phase to each Rosie input) and verify that all three Rosie's qualify and connect at the same time.