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Installation

Power Enclosure — MPER/SPER(S) -2/4-(IC36/24)

Overview

The Vantage Power Enclosure is the hub of a Vantage automation system. The enclosure is a connection point for loads that need to be dimmed or toggled. The enclosure may contain standard dimming modules, electronic dimming modules and relay modules or any combination. All connections are easily made via clearly labeled connectors. High voltage, low voltage, Secondary enclosures, RS-232 and RS-485 (RS-485 connections to InFusion enclosures only) communication devices may all be wired back to this control point.

Main and Secondary Power Enclosures are designed to fit perfectly between conventional framing, however, the enclosures may also be surface mounted. Four Main Power Enclosure and four Secondary Power Enclosure models are available, the MPER/SPER-4 or MPES/SPES-4, is a four module enclosure the MPER/SPER-2 and MPES/SPES-2, is a two module enclosure. The "R" is for recessed and the "S" is for surface mount. The same enclosure is used for InFusion and QLink Systems. The Main Terminal Board or the Secondary Terminal Board is the only *differing* component when ordered for an InFusion System or a QLink system. For an InFusion System the part number adds "-IC36" or "-IC24" to the end of the part number.

See: *Enclosure Mounting Instructions*, (below).

Specifications	M(S)PER-2	M(S)PER-4
Dimensions HWD	25"x14.5"x4" -or- 635mm 368mm 101mm	42"x14.5"x4" -or- 1066mm 368mm 101mm
Weight	15 lbs -or- 6.8 kg	26 lbs -or- 11.8 kg
Number of Modules	2	4
Line Feed Terminals (breaker feeds)	8	16
Load Terminals (loads out)	16	32
Neutral Terminals	24	48
Ground Bar Terminals	20	40
*Flash Memory (MPER-QLink System Only)	yes	yes
Cover	vented, hinged, self latching and locking	vented, hinged, self latching and locking
UL and CUL listed	yes	yes

*InFusion Enclosures do not have a flash memory chip in the enclosure it has been replaced with an MMC/SD flash card reader in the InFusion Controller.

System Requirements

Wire..... copper wire, minimum of 80°C / 176°F insulation
 Ventilation..... maintained 36" frontal clearance
 Ambient Operating Temperature..... 0-40°C / 32-104°F
 Ambient Operating Humidity..... 5-95% non-condensing

Enclosure Mounting Instructions

Installation of Vantage products should be performed or supervised by a *Certified Vantage Installer*.

1. Do not mount enclosures in attics, garages, or crawlspaces, unless room is properly ventilated to conform with room temperature and humidity requirements set forth (above).

2. Mount enclosure a minimum of 18" from ceiling and floor.
3. National Electrical Code requires a minimum frontal clearance of 36" for the enclosure.
4. Use eight 1½" screws for mounting MPER-4. Use four 1½" screws for MPER-2.
5. The surface mount enclosure (MPES-2/4) lid is designed to mount flush to the enclosure, so that multiple enclosures can be placed next to each other.
6. The recessed mount enclosure lid (MPER-2/4) has a 1/2" lip that extends past the enclosure side, concealing the edge of the enclosure next to the wall.

Wiring Instructions

Each enclosure has the following conduit knockouts:

Top and Bottom:

21 - 1/2" and 4 - 3/4" knockouts for high voltage wiring.

In the bottom of the enclosure it is recommended that low voltage knockouts in the center section be used for low voltage runs for complete isolation from high voltage runs. A metal cage surrounds the low voltage area of the enclosure.

Vantage recommends that the Main Controller be wired to a separate circuit breaker. It should not share a circuit breaker with any load modules.

If the installation has more than one enclosure, Vantage recommends that the Main and Secondary enclosures be connected to the same circuit breaker. This suggestion is based on the enclosures being in close proximity to each other. If the installation has multiple enclosure groups that are far apart it might not be feasible for the enclosures to share the same circuit breaker.

NOTE: *InFusion Systems* do not require a Secondary Controller or power to the Secondary Enclosure Terminal Board. *QLink Systems* with all new modules (MDS and MDR) models do not require a Secondary Controller or power to the *Slave Terminal Board*. For older *QLink Systems* using SD-Series, ED-Series and AR-Series modules, Vantage recommends that the *Slave Controller* be wired to a separate circuit breaker. It should not share a circuit breaker with any load modules. **SD, ED, and AR-Series modules are not compatible with 36Volt InFusion Systems but will work with 24Volt InFusion Systems.** Older *QLink Systems* with Secondary enclosures containing these type modules must use the *QLink system (slave) terminal board and Slave Controller* even when converted to an *InFusion System*.

Main Controller to Main Controller Wiring

When connecting multiple Main Enclosures, Vantage recommends the use of 16-18 AWG 2-conductor, twisted pair, non-shielded wire from Main Enclosure to Main Enclosure. *This is a polarized connection* with "+" and "-" screw terminals for two runs of wire. The beginning and ending Main Enclosures will use one set of screw terminals at the Controller Bus terminals and all Main Enclosures in-between will use both sets of screw terminals on the Controller Bus terminals, i.e., one set of screws connecting from the previous enclosure and the other set of screws continuing to the next enclosure. The maximum wire length for all Controllers connected together on one bus should not exceed 2,000ft. in *InFusion Systems* or 1,000ft. in *QLink Systems* using the above wire specification.

NOTE: InFusion Systems can also use Ethernet connections for Controller to Controller communication. Please see the InFusion Controller instruction sheet.

Station Bus Wiring

WireLink stations connect to the station bus at the screw terminals. Station bus wire specification: Vantage wire (part VDA-0113) or equivalent – 2C twisted pair, **non-shielded**, 16AWG, less than 30pF per foot, CL3 wire. Maximum total station bus wire, each run = 2,000 feet, no station more than 1,000 feet from enclosure. Station Bus should be separated a minimum of 18" from other parallel communication and/or high voltage runs.

Main Enclosure to Secondary Enclosure Wiring

Connecting a Main Enclosure to a Secondary Enclosure requires 16/18-gauge 4-conductor non-shielded wire. Three of the wires are *always* used to connect the Main Enclosure to the Secondary Enclosure. This is a polarized connection with "+", "-", and "Gnd" screw terminals for communication. The 4th wire is for Manual Override and is optional. The **InFusion System** uses an enhanced Secondary Enclosure Bus. Each Secondary Enclosure Bus can support **two** Secondary Enclosures for a maximum of six Secondary Enclosures (see InFusion wiring below) per Main Enclosure. In the **QLink System** each Secondary Enclosure must be wired directly to the Main Enclosure Terminal Board, *do not daisy chain*, for a maximum of three Secondary Enclosures. Maximum wiring distance from Main Enclosure to Secondary Enclosures is 200ft including an A/B InFusion system.

Main Terminal Board Terminator

If only one Main Enclosure is used, the *Controller Bus Termination* (InFusion) or *Master Network Termination* (QLink) switch must be ON. This switch is located on the *Enclosure Terminal Board*. If multiple Main Enclosures are used **ONLY** the first and last Enclosure Terminal Boards on each bus should have the *Network Termination* switch set to ON. **Example:** In a five Main Enclosure system, Main Controllers 1 and 5 are not necessarily the first and last Controllers, i.e., the "wiring" order could be 2-1-3-5-4. In this example, Main Enclosures 2 and 4 are the first and last Controllers in the network, so only these two would have the *Network Termination* switch ON, the other three must be set to OFF.

RS-232 (Ports 1-5) for InFusion

The Main Enclosure Terminal Board has five RS-232 ports. Vantage recommends using these ports to connect RadioLink enablers or any device that uses RS-232 communication. Any compatible RS-232 device may be connected to this port, however; only one device should be connected at a time to any RS-232 port. Vantage also manufactures an RS-232 Station if you require multiple or remote RS-232 connections.

Vantage typically uses RX, TX and GND for communication but does have RTS and CTS for some applications on RS-232 Ports 1 and 2. RS-232 Ports 3-5 only have TX, RX and GND. All five ports can use software flow control. The default protocol may be changed through Design Center software.

Communication protocol settings:

Standard baud rates 1200 – 115.2K ● 7-8 Data Bits ● Even, Odd, Forced or No Parity ● 200ft. maximum wiring distance

The default protocol for RS-232 communication is:

Baud: 19200 ● Parity: None ● Total bits: 8 ● Stop bits: 1

RS-232 (Port A) for QLink

An external RS-232 port is available via the *Master Terminal Board*. Vantage recommends that this RS-232 port be used with a Q-Modem-A, a RadioliNK Enabler or an IP Enabler. If multiple Main Controllers are used on a system, the other RS-232 ports can be used with third party RS-232 devices. The default communication protocol is: Baud=19200, Parity=none, Total bits=8, Stop bits=1, and Flow Control=none. This RS-232 port can also be configured, using QLink software. Vantage also manufactures an RS-232 Station if you require multiple or remote RS-232 connections.

RS-485 Connections for InFusion

The Main Enclosure Terminal Board has two RS-485 ports. These ports are shared with Secondary Enclosure ports 3 and 4. *The ports may not be used for Secondary Enclosure support and RS-485 support simultaneously.* However, if Secondary enclosure Bus ports 3 and/or 4 are free they may be used as RS-485 communication ports. The RS-485 ports are *half-duplex*, meaning that each port can transmit and receive but not at the same time. Maximum wiring distance for RS-485 ports is 200ft.

Possible Ground Loop Issues

All RS-232/RS-484 connections between third party equipment and RS-232/RS-485 connections on the Main (Master) Enclosure Terminal Board, *may* produce a ground loop. Most often the connected RS-232/RS-485 device is not using the same power source or is far away from the Vantage enclosure resulting in a possible ground loop or data noise condition. If this condition is suspected, Vantage recommends a third party RS-232/RS-485 Opto (optical) Isolation Module. Opto Isolation provides a communications link and is an important consideration if a system uses different power sources, has noisy signals or must operate at different ground potentials.

Auxiliary Power:

The **InFusion System Main Enclosure Terminal Board** has a 12VDC auxiliary power connection. The 12VDC connection is typically used for one RF Enabler. Total power is limited to 250ma. NOTE: If additional RF Enablers are connected to the Main Enclosure Terminal Board, they must be powered externally.

The **QLink System Master Terminal Board** has 12VDC and 24VDC power connections. The 12VDC connection is normally used with a RadioLink Enabler, an IP Enabler or a Vantage Modem. The available current is limited to 0.250A (250mA) or if the system is using all new modules with the MDS or MDR model numbers the current is limited to 0.750A (750mA). The 24VDC connection should not be used with systems that have more than 20-30 stations connected.

QLink Secondary Auxiliary Power:

QLink's *Slave Terminal Board* has a 12VDC power connection. The 12VDC connection is provided for any device meeting this power specification. The available current is limited to 0.250A (250mA). This power is *only* available when a Slave Controller is used. Remember new MDS-Series and MDR-Series modules and InFusion Systems do not use a Slave Controller.

Manual Override

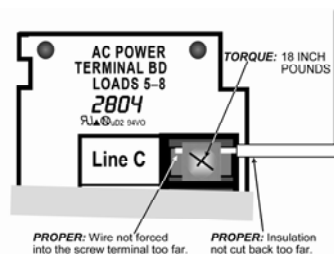
In the unlikely event of a Main Controller Failure, the Manual Override can be used to turn selected loads ON. If the system is in override, individual loads can be controlled by dip-switches located on each Module in the enclosure. Manual Override control can be extended to other enclosures. It is common to extend Manual Override between a Main Enclosure and its Secondary enclosures. It is not recommended to extend Manual Override Between Main Enclosures.

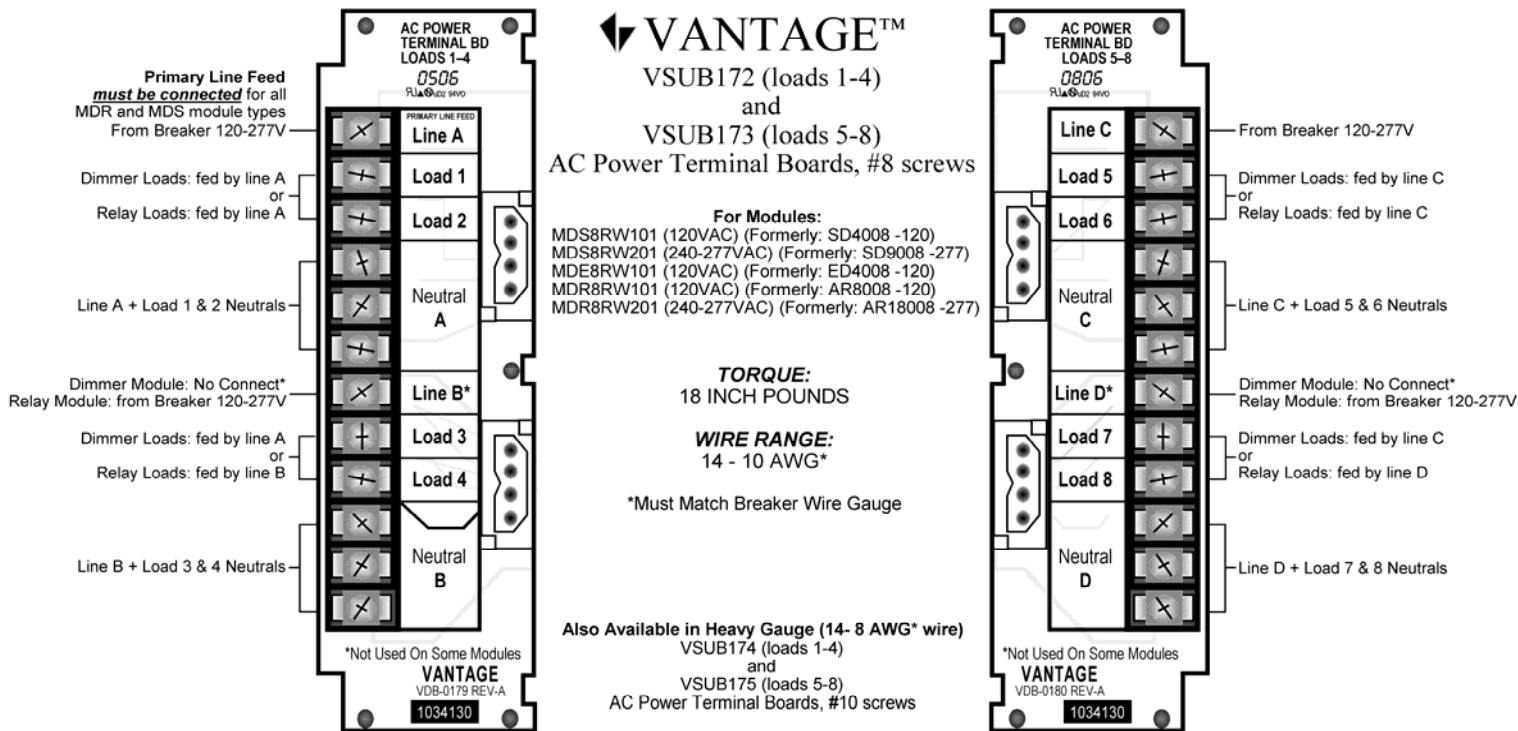
Proper High Voltage Terminations:

PROPER TORQUE:

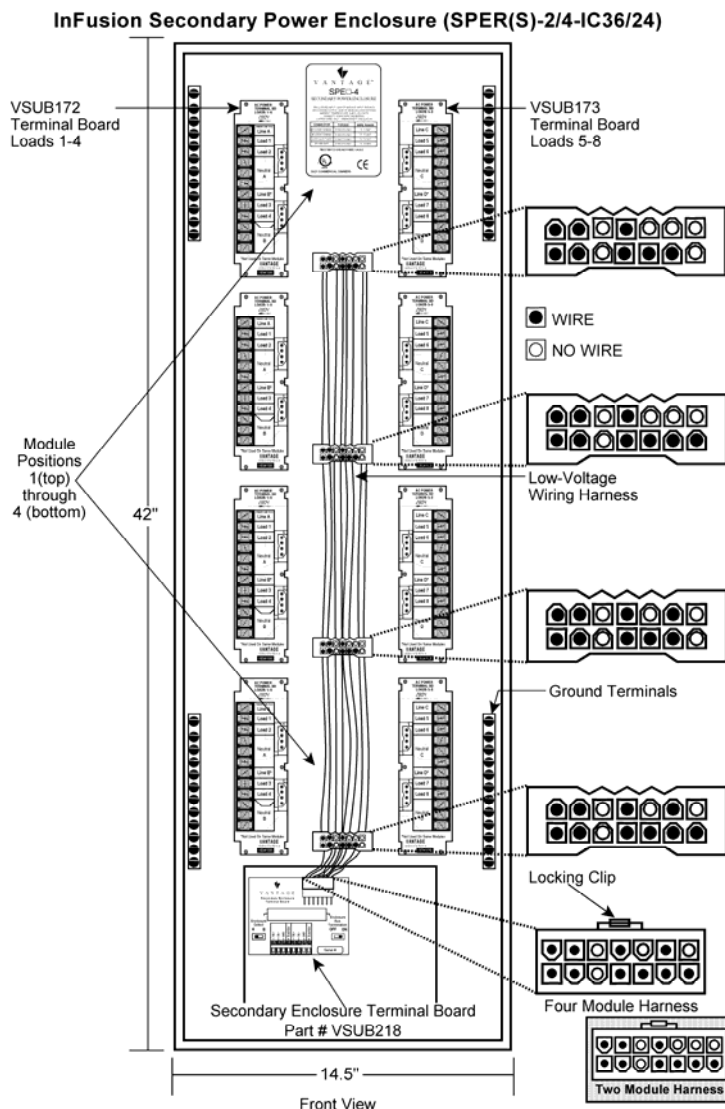
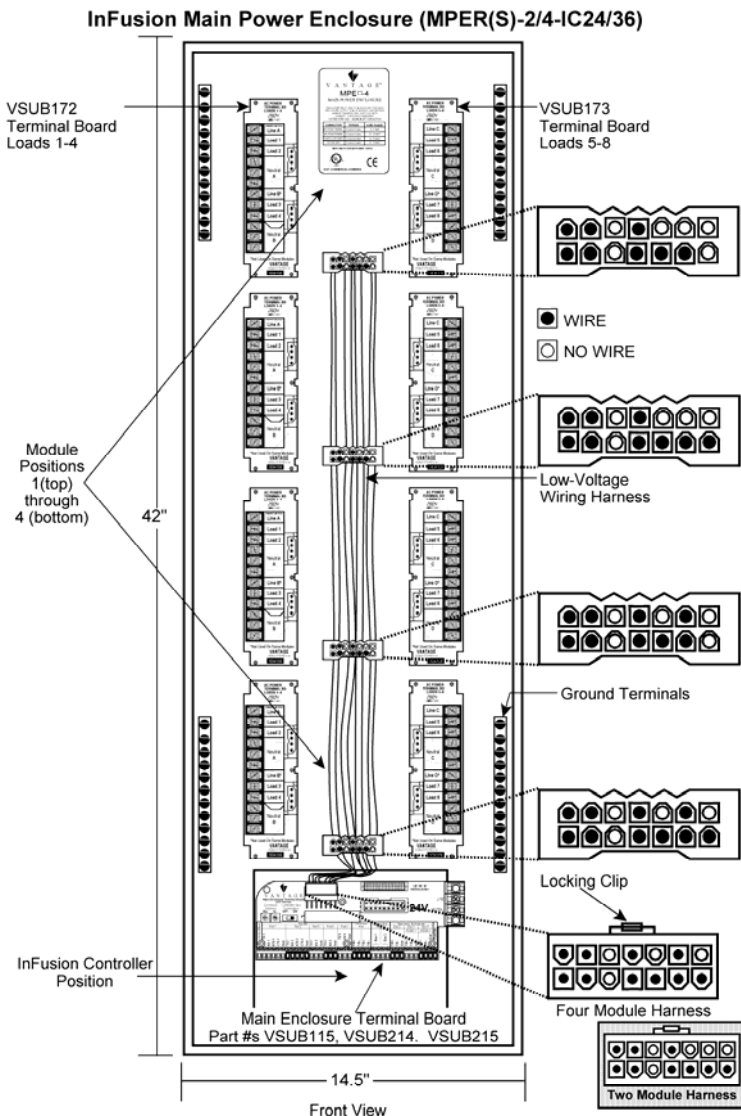
CONNECTOR	TORQUE	WIRE RANGE
#10 SCREW TERMINAL	18 INCH POUNDS	14-8 AWG*
#8 SCREW TERMINAL	18 INCH POUNDS	14-10 AWG*
ENCLOSURE POWER	18 INCH POUNDS	14-10 AWG*
GROUND BARS	35 INCH POUNDS	14-10 AWG*

*MUST MATCH BREAKER WIRE GAUGE





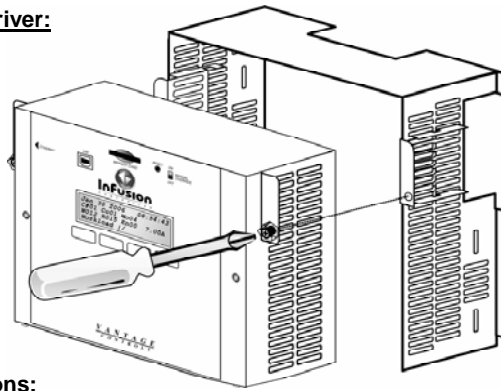
InFusion and **QLink** Enclosures are identical except the **Terminal Boards** in the bottom of each Enclosure:



Shipping may have loosened Wiring Harness Pins. Please make sure they are securely inserted into the proper holes.

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Controller Locking Screws - Use Phillips #2 Screwdriver:

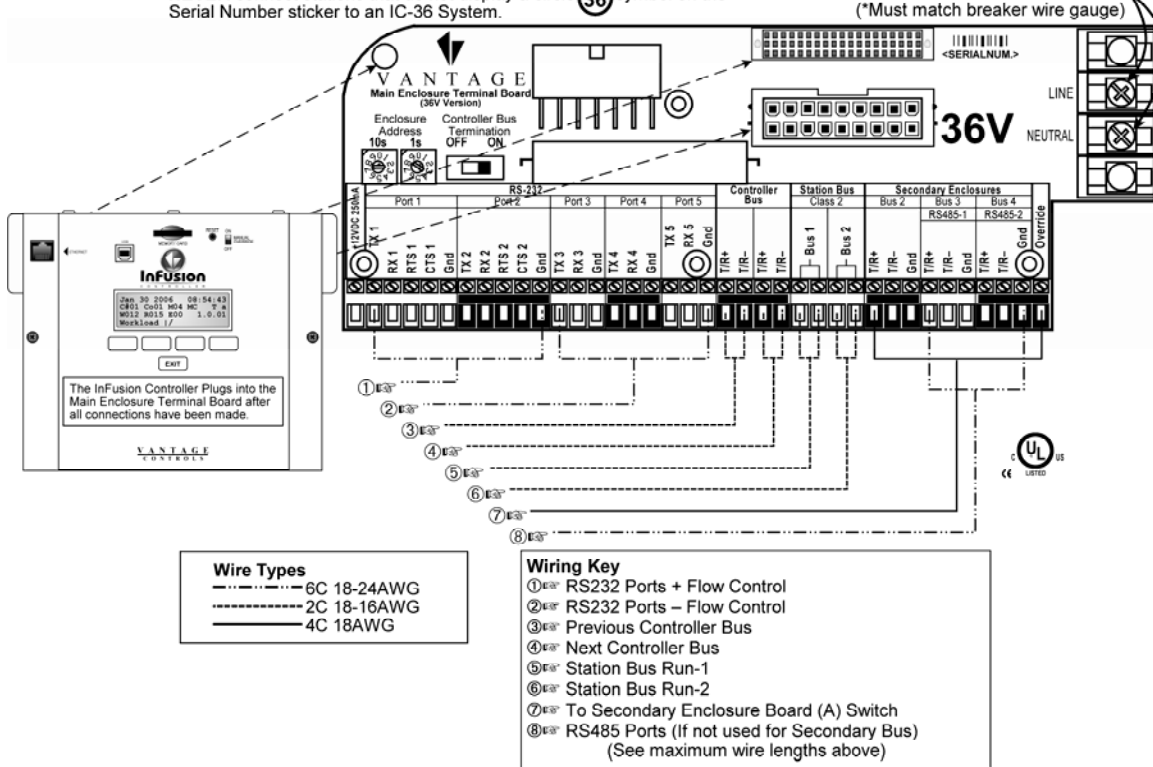


InFusion Main Enclosure Terminal Board Terminations:

CAUTION: For retrofit jobs, this board is also available in a 24V version for the IC-24 Controller. **NEVER** connect stations that do not display a circle 36 symbol on the Serial Number sticker to an IC-36 System.

Torque: 18 inch pounds
Wire Range: 14-10 AWG*

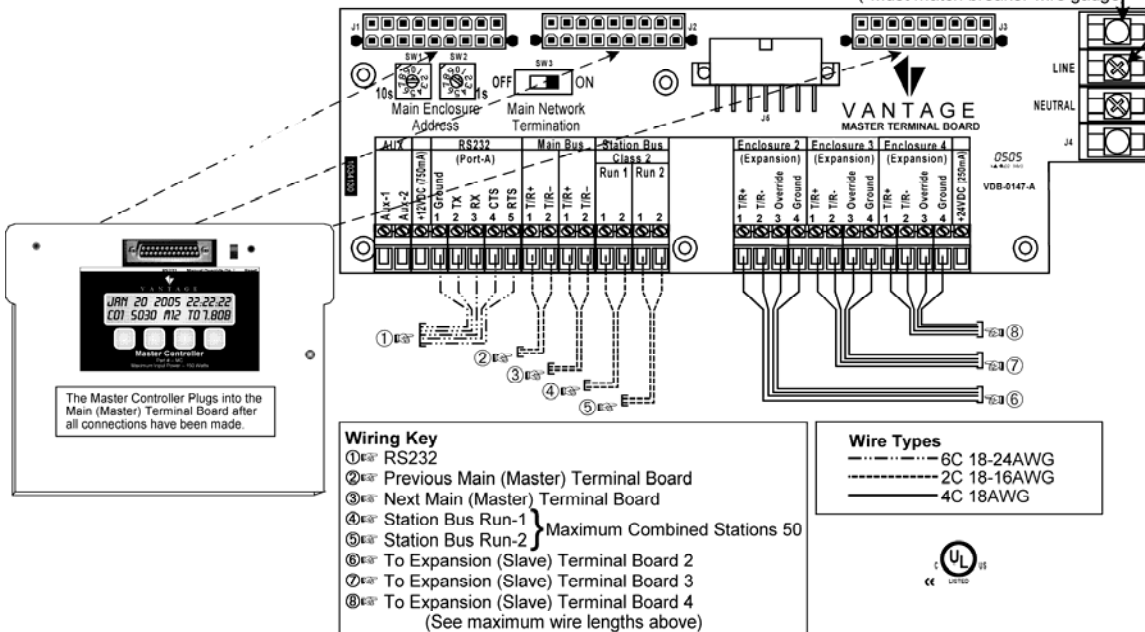
(*Must match breaker wire gauge)



QLink Master Terminal Board Terminations:

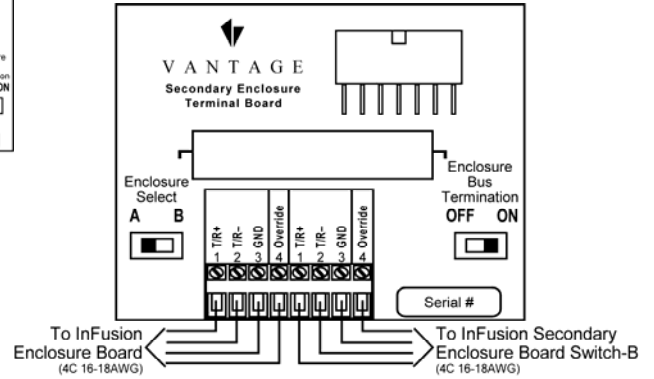
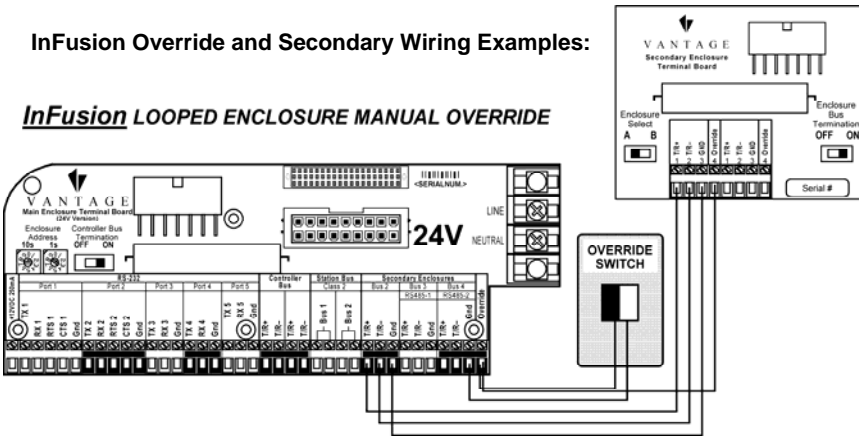
Torque: 18 inch pounds
Wire Range: 14-10 AWG*

(*Must match breaker wire gauge)

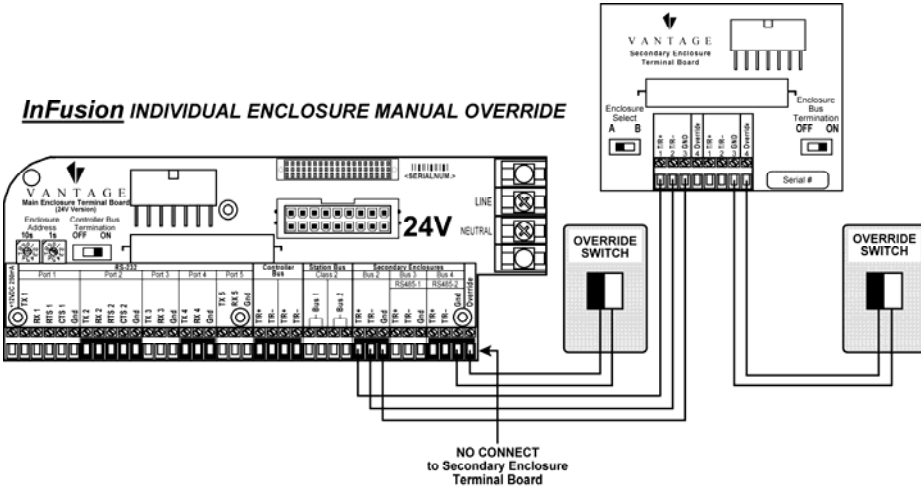


InFusion Override and Secondary Wiring Examples:

***InFusion* LOOPED ENCLOSURE MANUAL OVERRIDE**

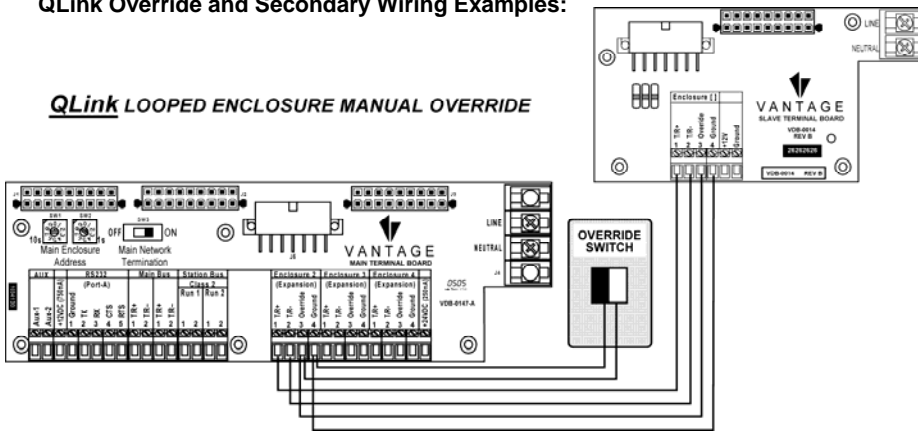


***InFusion* INDIVIDUAL ENCLOSURE MANUAL OVERRIDE**

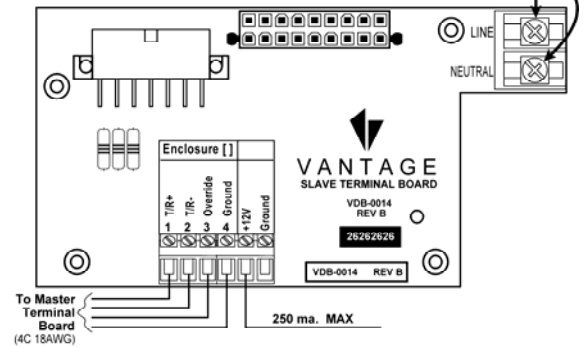


QLink Override and Secondary Wiring Examples:

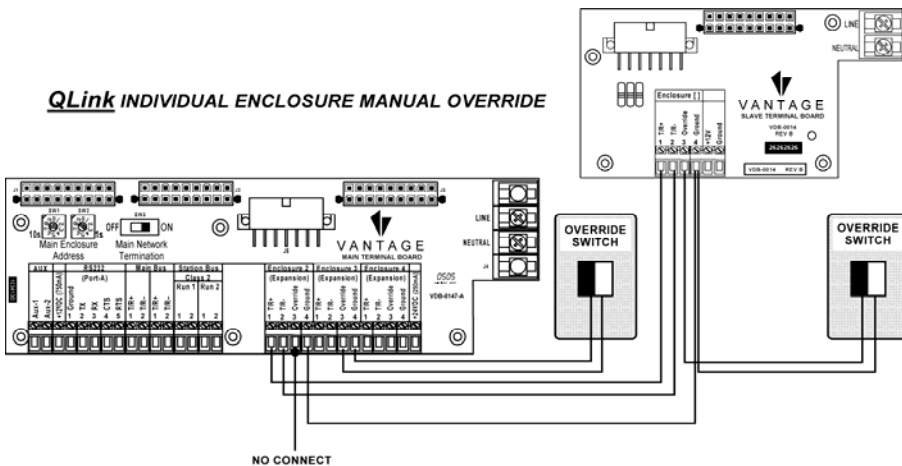
***QLink* LOOPED ENCLOSURE MANUAL OVERRIDE**



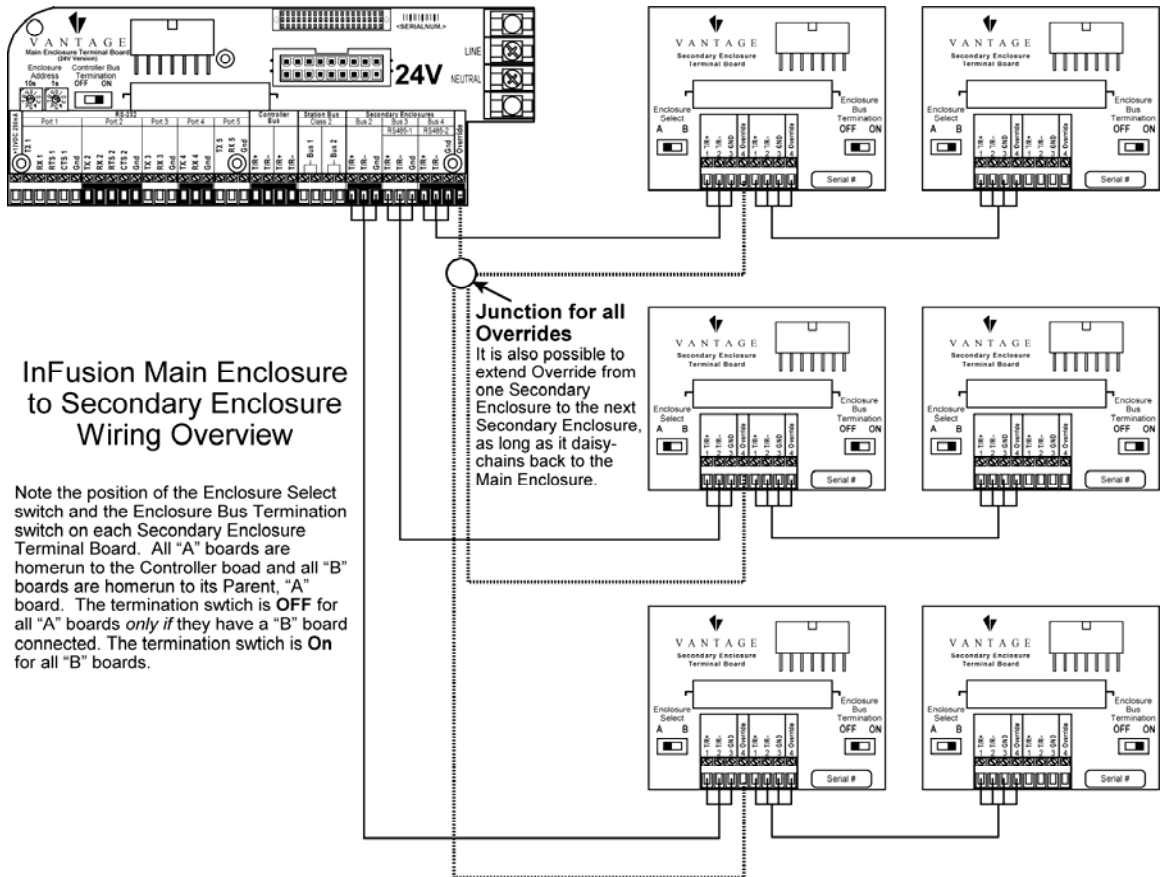
Torque: 12 inch pounds
Wire Range: 14-12 AWG
 (Must match breaker wire gauge)



***QLink* INDIVIDUAL ENCLOSURE MANUAL OVERRIDE**



Detail Wiring InFusion Main Enclosures to InFusion Secondary Enclosures
 (See wire specifications above)



Enclosure Assembly:

