

TECH BRIEF

Isolated Ground versus Dedicated Ground

Introduction

The Starline Busway systems allow for three grounding configurations: Standard, Isolated Ground (IG) and Dedicated Ground (DG). The three different configurations are meant to provide several options to connect the ground contacts within the busway system depending on customer application. This tech brief will explain the differences between the three types of ground and provide some examples of where they apply.

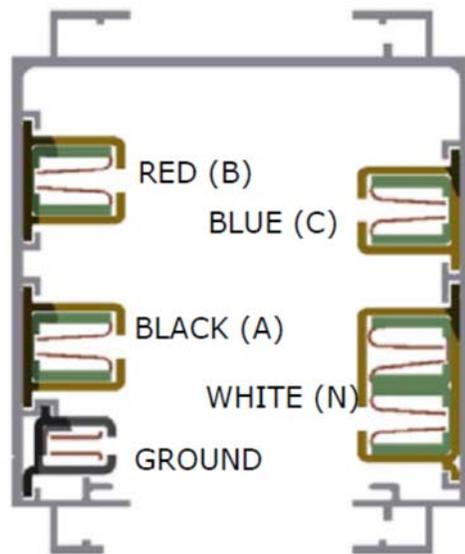


Figure 1: Cross section of a grounded Busway

Author: CJO, DRK
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Explanation and Application

Starline busways that are either DG or IG contain a ground conductor that runs through busway along with neutral and the 3 phases (A,B,C), see Figure 1. **Dedicated Ground (-DG)** is where the ground conductor and the housing ground are bonded together. The connection is applied on the plug-in units by wiring the ground wire from the paddle to the enclosure ground stud and the receptacle ground contact to the enclosure ground stud. Similarly, the electrical installer should wire the end feeds in the same manner. The isolated ground bar should be tied to the enclosure.

Or separate, **Isolated Ground** busway systems have the ground conductor and the housing ground isolated from each other in ALL components. For plug-in units, the paddle's ground contact is wired directly to the ground contact on the receptacle with *no* connection to the enclosure. **Note** that when an isolated ground system is used, isolated ground receptacles must be used, and all components within the system must also have the ground conductors separated (Isolated Ground components) or else IG will no longer apply.

A **Standard** system does not have the ground conductor in the busway. Instead, the housing of the busway and plugin unit's enclosure provide the system's ground conduction.

Busway systems can have increased noise and electromagnetic interference in the grounding network caused by system loads and other sources. This can negatively affect operation of sensitive electronic equipment, such as medical devices or point of sale terminals. An IG busway system offers a "cleaner" ground for more sensitive equipment by providing an isolated ground conductor. The separation helps reduce and even eliminate electronic noise in the system. Systems that are less sensitive to noise do not need isolated ground therefore the standard Non-Isolated Ground or DG would work.

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Summary:

Housing ground

- Standard Busway 3P+N
- The aluminum housing is used as a 100% ground path
- Busway sections do not incorporate a ground conductor within the housing
- Plug-in units do not incorporate a ground stab on the paddle
- Receptacle and connector body grounds are connected to the enclosure ground terminal

Isolated ground

- Busway conductors: 3P, N, Ground
- Internal copper ground conductor within the housing is required for isolated ground
- The housing and the internal ground conductor are separate grounds that are electrically isolated
- The isolated ground wire should pass through the end feed units and panelboards without connecting to ground terminals and must be landed at the ground terminal at the circuit origin
- Plug-in units incorporate a ground stab on the paddle
- Paddle ground wire connects directly to the ground terminal of an isolated ground receptacle or the ground terminal of a connector body
- Isolated ground is separate from the housing and equipment ground and helps to eliminate noise on the ground
- **Receptacles** - MUST use Isolated ground receptacles (orange w/ triangle indicator)
- **DC units(Connector Bodies)**-Wired directly from paddle ground to the ground contact on the connector
- Plug-in units contain a 'G' in the prefix
- Ex Catalog numbers: CB225GE12-L620D-4, CBDC225GE12-X-L630C-4

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Dedicated Ground “-DG”

- Busway conductors: 3P, N, Ground
- The internal ground conductor and housing ground are bonded together in each plug-in unit and should be bonded together in the busway feed
- Plug-in units incorporate a ground stab on the paddle
- Paddle ground wire connects to the enclosure ground terminal
- Standard receptacle and connector body grounds are also connected to the enclosure ground terminal
- **DC units(Connector Bodies)** -The paddle ground wire is landed on the enclosure along with the ground wire from the drop cord that connects to the ground contact on the connector
- **Receptacles** - Standard receptacles are used in the “-DG” units

******Choosing a –DG unit on a true Isolated ground system will create a common bonding point between the ground paths, thus defeating the isolated ground system. All units must be isolated ground.

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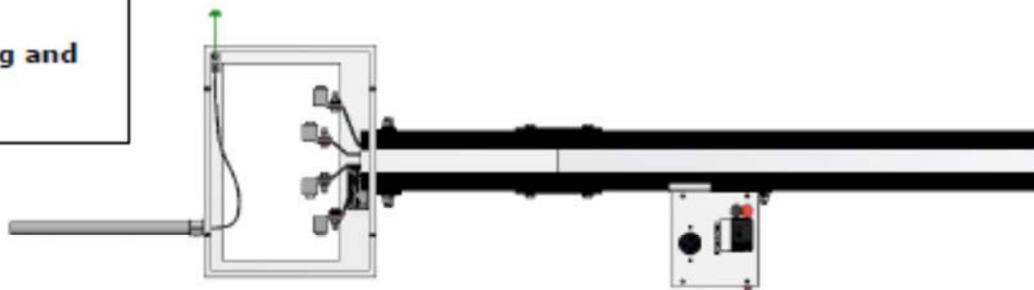
CASE GROUND

Uses aluminum housing and no extra copper bar.

B100
B225



T5



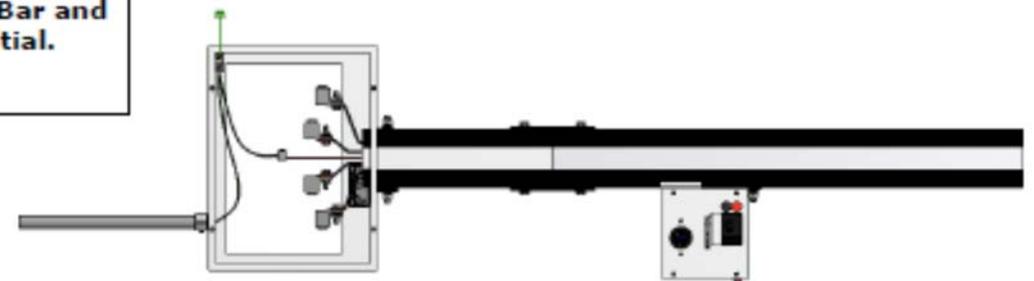
DEDICATED GROUND

Extra bar in busway for ground. Everything tied together inside plugs. Bar and housing at same potential.

B100
B225



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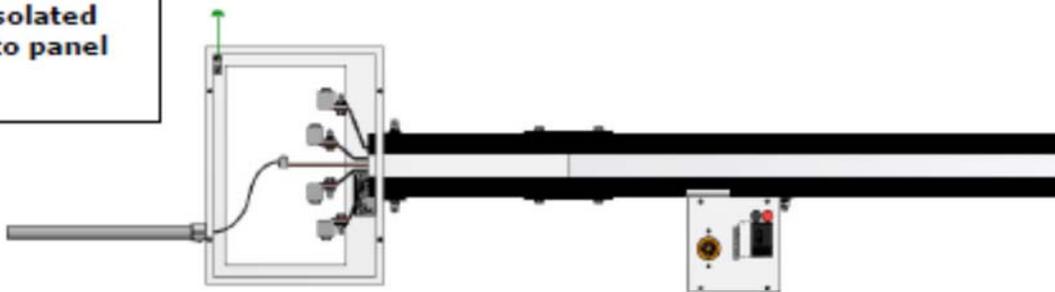
ISOLATED GROUND

Orange receptacles in plugs. Case ground isolated from copper ground bar. Isolated ground carried back to panel by others.

B100
B225



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