



# MANUAL

## T5 DOUBLEBAR SYSTEMS

INSTALLATION, OPERATION, &  
MAINTENANCE MANUAL

# T5 DoubleBar Systems

## REVISION REGISTER

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# T5 DoubleBar Systems

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# T5 DoubleBar Systems

## PRODUCT SPECIFICATION



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## Section 1: Product Specification

# T5 DoubleBar Systems

## PRODUCT SPECIFICATION

### 1 Summary

- 1.1** This specification covers the electrical characteristics and general requirements for a high amperage track busway system, hereafter referred to as DoubleBar. The system shall be designed primarily for overhead power distribution of electrical power. Once installed, DoubleBar provides a simple, versatile, fast and economic means of distributing power. Loads fed from High Amperage Track Busway plug-in units can be added or removed without shutting down the busway. To achieve 2000 A ampacity while retaining open channel busway features, the system utilizes two Starline T5 busways paralleled electrically and connected mechanically.
- 1.2** Specification includes:
  - 1.2.1** Three-phase High Amperage Track Busway system with the following features:
    - 1.2.1.1** Dual extruded aluminum busway housing with electrically parallel conductors
    - 1.2.1.2** Single Power Feed with Dual Busway Run Output
    - 1.2.1.3** Plug-in units for power distribution
    - 1.2.1.4** Monobloc joint kits
    - 1.2.1.5** Custom Unistrut mounting brackets for overhead suspension
    - 1.2.1.6** Optional accessories

### 2 Standards and Certification

- 2.1** DoubleBar shall be designed and manufactured to the following standards:
  - 2.1.1** Electrical Testing Laboratories (ETL) (US/Canada) Certified to UL 857.
  - 2.1.2** CE (Europe) Certified to IEC 61439-1 and IEC 61439-6.
  - 2.1.3** National Electric Code (NEC) – Article 368 – Busways
  - 2.1.4** National Fire Protection Agency (NFPA) – 70, National Electric Code (NEC)
  - 2.1.5** Institute of Electrical and Electronics Engineers (IEEE) 693-2018, High Seismic Level\*  
\*Certification pending
  - 2.1.6** National Electrical Manufacturers Association (NEMA) – AB1, Molded Case Circuit Breakers and Molded Case Switches (if applicable)
  - 2.1.7** National Electrical Manufacturers Association (NEMA) – KS-1, Enclosed and Miscellaneous Distribution Equipment Switches (600 VAC) (if applicable)

### 3 System Description

- 3.1** Electrical Requirements
  - 3.1.1** System voltage: 1000 V AC/DC
  - 3.1.2** Frequency: 50/60 Hz.
  - 3.1.3** Ampacity: 2000 A
  - 3.1.4** Neutral Ampacity: Minimum of 100% of rating
  - 3.1.5** Short circuit ratings:
    - 3.1.5.1** UL 857:

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## PRODUCT SPECIFICATION

**3.1.5.1.1** 85 kAIC up to 600 VAC for 3 cycles

**3.1.5.1.2** 65 kAIC up to 1000 VAC for 3 cycles

**3.1.5.1.3** 50 kAIC up to 1000 VDC for 50 milliseconds

**3.1.5.1.4** Isolated Ground Systems:

**3.1.5.1.4.1** 65 kAIC up to 600 VAC\*\* for 3 cycles

\*\*Minimum one tap-off unit to be installed for every 10 feet of busway required to achieve this rating

**3.1.5.1.4.2** 50 kAIC up to 1000 VDC for 50 milliseconds

**3.1.5.2** IEC 61439:

**3.1.5.2.1** 70 kA l<sub>cw</sub> up to 415 VAC, 50 Hz, 1 second duration

**3.1.5.2.2** 50 kA l<sub>cw</sub> up to 1000 VDC, 50 Hz, 1 second duration

**3.1.5.2.3** Isolated Ground Systems:

**3.1.5.2.3.1** 50 kA l<sub>cw</sub> up to 415 VAC, 50 Hz, 1 second duration

**3.1.6** Conductors: Each busway run shall include three (3) hybrid phase conductors and one (1) neutral hybrid conductor of solid, tin-plated copper and aluminum. Conductors shall be electrically joined between parallel busway sections at intervals not to exceed 10 feet (3 meters).

**3.1.7** Grounding: The aluminum housing shall serve as the primary ground. An optional, additional dedicated solid, tin-plated copper grounding conductor per busway run may be provided. The housing and grounding conductors shall be electrically joined between parallel busway sections at intervals not to exceed 10 feet (3 meters) when measured centerline to centerline between Monobloc joiners.

## **3.2** Operational Requirements

**3.2.1** Environmental Conditions: DoubleBar shall be capable of operating continuously in the following environmental conditions without mechanical or electrical damage, performance degradation, or derating operating capability.

**3.2.1.1** Operating temperature: DoubleBar shall operate with continuous load with no derating up to 40 degrees Celsius.

**3.2.1.2** Relative humidity: DoubleBar shall operate with continuous load with no damage or degradation at a relative humidity of 0 to 95 percent, noncondensing.

**3.2.1.3** Altitude: DoubleBar shall operate with continuous load with no damage or degradation when operated from sea level up to 4,000 feet (1,220 meters).

## **3.3** Manufacturing Requirements

**3.3.1** All DoubleBar components and accessories shall be manufactured by the Starline, a brand of Legrand, in one of 4 global locations:

**3.3.1.1** USA

Starline Holdings, LLC.

168 Georgetown Rd.

Canonsburg, PA 15317

+1 724-597-7800

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## PRODUCT SPECIFICATION

- 3.3.1.2** United Kingdom  
Starline Holdings Technology LTD.  
Unit C, Island Road  
Reading, Berkshire  
RG2 0RP  
+44 (0) 1183 043180
- 3.3.1.3** Singapore  
Starline Holdings Technology Pte. Ltd.  
16D, Tuas Avenue 1, #04-60/62  
JTC Space @ Tuas  
Singapore 639536  
+65 6950 1240
- 3.3.1.4** Mexico  
Legrand  
Bulevar Tomás Fernández 3751  
Col. Bermúdez  
32470 Ciudad Juárez, Chih.  
México

## 4 Submittals

- 4.1** Submittals shall be in accordance with specified procedures. Submit shop drawing and product data for record purposes prior to shipment. Shop drawings for DoubleBar must include:
  - 4.1.1** Detailed equipment assemblies and dimensions, weights, location and identification of each field connection
  - 4.1.2** Wiring Connection: For power wiring
  - 4.1.3** Orientation of plug-in units face in final installation. Include plug-in schedule with detailed description.
  - 4.1.4** Plug-in schedule with detailed description
- 4.2** Provide electrical characteristics and connection requirements for the system and accessories.
- 4.3** Indicate special receiving and handling procedures.

## 5 Warranty

- 5.1** The DoubleBar manufacturer shall guarantee the entire system against defective material and workmanship for a period of one (1) year from date of shipment.
- 5.2** Additional years of warranty and ability for start-up services must be an option if required per drawings.
- 5.3** Warranty shall only cover DoubleBar product components manufactured by Starline Holdings, LLC.; use of any aftermarket components with Track Busway shall void the warranty and any certifying listings completely.

## 6 Product Components

- 6.1** DoubleBar Housing: The extruded aluminum housing shall be certified to function as a 100% ground conductor. Housings shall be available in standard lengths of 4, 6, 8, and 10 feet as well as 1.5, 2, 2.5, and 3 meters. Each housing shall be precisely extruded with an integral slot designed to accommodate rod-mount hangers attached

# T5 DoubleBar Systems

## PRODUCT SPECIFICATION

to custom steel Unistrut brackets for ceiling suspension via all thread connections. Each run of busway housing shall feature an open bottom to allow plug-in units to be installed at any point along its length. The bottom opening shall comply with UL requirements for the hypothetical finger probe test.

- 6.1.1** All conductors shall be made of copper or copper/aluminum and sized to handle 100% of their rating continuously up to the maximum ambient temperature. The conductors shall be electrically isolated from the housing. All insulators must be UL and IEC compliant.
- 6.1.2** The busway shall be loaded with no more than 1000 A connected to any one single run of T5 busway.
- 6.1.3** DoubleBar housing sections shall be joined together by a Monobloc joint in a sandwiched conductor configuration.
- 6.1.4** DoubleBar shall have an included data channel built into the housing to accommodate optional, color-coded data cabling accessories.
- 6.1.5** DoubleBar housing shall be painted and available in standard silver, red, blue, black, white or custom RAL colors.

### 6.2 Power Feed

- 6.2.1** The power feed shall provide connections from the incoming cables to the DoubleBar system. The power feed shall have internal connection to conductive aluminum blades terminated in a Monobloc joint feeding a section of dual run busway. Feeds shall have the option to be designed with mechanical or compression-type lugs.

### 6.3 Plug-In Units

- 6.3.1** Plug-in units shall utilize the same electrical interface as single run T5 Track Busway system and be interchangeable between dual run and single run systems.
- 6.3.2** Plug-in units shall be polarized to avoid incorrect installation.
- 6.3.3** Plug-in units can be added, removed or repositioned without de-energizing the busway.
- 6.3.4** Plug-in units shall use either a circuit breaker or a fuse for branch circuit protection as shown in the schedule on the project drawings.
- 6.3.5** Plug-in units shall be capable of being built with customer-specified circuit protection, outlets and accessories.
- 6.3.6** Plug-in units shall have locking clips or bolt-on tabs for securing units to the busway.
- 6.3.7** Plug-in units that include drop cords shall be manufactured with cord grips and receptacles as specified in the drawings.
- 6.3.8** Plug-in units shall be configured by the manufacturer to balance the load based on quantity of plug-in unit types provided.
- 6.3.9** Plug-in units shall have the ability to provide up to a 600-amp load in certain plug-in unit configurations.
- 6.3.10** Plug-in units shall have a minimum rating of 10 kAIC and the ability to obtain a maximum rating of 200 kAIC.
- 6.3.11** Plug-in unit authenticity shall be proven by the presence of a Starline ratings label.

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## PRODUCT SPECIFICATION

### 6.4 Accessories (*OPTIONAL*)

- 6.4.1** Closure strip shall be available for conductor access points to minimize accidental contact or build-up of debris.
- 6.4.2** Integrated cable management solutions are available as part of the busway aluminum housing, capable of handling accessories such as the data channel cover, hinged wire way, data cable strap, and multi-use mounting bracket.
  - 6.4.2.1** Data channel covers are color-coded for integrated cable management solutions.

## 7 Installation

- 7.1** The contractor shall install DoubleBar in accordance with the manufacturer's instructions.
  - 7.1.1** DoubleBar runs shall consist of lengths as shown on the drawings.
  - 7.1.2** The plug-in unit orientation shall be indicated on the drawings.
  - 7.1.3** Hanging of the Busway: DoubleBar shall be suspended from overhead structural support using the supplied busway hangers and custom Unistrut mounting brackets. Threaded rods provided by the installing contractor shall attach to the Unistrut brackets to enable ceiling suspension. Hangers shall be installed with a maximum of 5 feet (1.5 meters) between adjacent hangers.
  - 7.1.4** The busway shall be installed with the open access channel facing downward.
  - 7.1.5** Connecting Sections of DoubleBar: At each junction between High Amperage Track Busway DoubleBar sections, the installer shall use a Joint Kit consisting of a Monobloc joint assembly and enclosure. Busway sections are connected by copper adapter blades inserted into the conductors of the adjoining runs and positioned between the conductive plates of the Monobloc joint. Monobloc bolts shall be tightened to the specified torque to form electrically parallel connections for each phase, and the joint shall then be enclosed to maintain the specified ingress protection rating. For torque requirements, refer to the DoubleBar Operation and Maintenance Manual. Sections can be configured for shipment with or without the Monobloc joint pre-installed from the factory on one end.
  - 7.1.6** End of Runs: End caps should be ordered for installation at the end of each run.
  - 7.1.7** Closure Strip: The closure strip is an optional accessory that can be cut and fitted to cover the bottom opening of each busway run of DoubleBar housing to prevent dust and debris. Closure Strip can be field modified for fit.
  - 7.1.8** CYCLIC LOADING WARNING: When DoubleBar is installed in applications subject to cyclic power loading, additional joint monitoring and maintenance may be required to ensure continued electrical performance and long-term material integrity. Consult Applications Engineering for guidance on application- or product-specific requirements.

## 8 Field Quality Control

- 8.1** Manufacturer's Field Services: DoubleBar shall be accompanied by optional services, such as on-site support and system startup, ongoing support, and extended warranty programs. These services include:
  - 8.2** On-site Contractor Pre-Installation Training
  - 8.3** Meter Programming and Start-Up
    - 8.3.1** Programming of all provided meters with specified communication protocol settings.

# T5 DoubleBar Systems

## PRODUCT SPECIFICATION

**8.3.2** Verification of correct CT orientation and meter functionality.

**8.4** Level 3 Start-up and Commissioning (Pre-Functional Testing) performed by a Manufacturer Certified Technician:

**8.4.1** Manufacturer's Specifications based upon NETA ATS-2021 and NEMA BU 1.1

**8.4.2** Mechanical Inspection and Electrical Testing to include:

**8.4.2.1** Inspection of each busway run to ensure all parts are installed as intended.

**8.4.2.2** Inspection of each joint and connection point of the busway including housing couplers.

**8.4.2.3** Inspection of incoming conduit entry at each busway end feed.

**8.4.2.4** Ensuring the busway is correctly and safely mounted.

**8.4.2.5** Verification the ends of the busways are capped correctly.

**8.4.2.6** Verifying correct connections to the busway feeds in accordance with the single-line diagram.

**8.4.2.7** Verifying correct CT orientation of meters if applicable.

**8.4.2.8** Performing insulation resistance tests on each busway phase to phase, and phase to ground.

**8.4.2.9** Submission of system start-up and certification report with recommendations and findings submitted to the contractor.

**8.5** Completion of Level 3 Start-up shall extend the busway and feed product warranty for an additional one year.

**8.6** Manufacturer to provide compact load bank rental tap-offs (TBT5G-250/400-4DG-LOADBANK-RENTAL or TB225-4-LOADBANK-RENTAL) for Level 4 and 5 commissioning.

**8.7** Level 4 Load Bank Testing and Commissioning (Functional Performance Testing) performed by Manufacturer Certified Technicians to include:

**8.7.1** Load Bank testing each busway system for a duration of 2 hours at required load.

**8.7.2** Thermally scanning each joint and feed connection.

**8.7.3** Thermographer certified by FLIR to perform infrared scanning and to include certification number on report.

**8.7.4** Submission of load testing report and full thermographic survey.

**8.8** Support Commissioning Agent on-site during IST testing with any questions related to busway.

**8.9** Manufacturer must Provide an Optional Preventative Maintenance Plan and Infrared Scanning per NETA MTS 2023 one year after installation.

**8.10** On-Site Owner Product Training Post Installation

**8.11** Manufacturer must provide an optional Recertification and Extended Warranty Program.

**8.12** 24/7 Emergency Service and Phone Support

## 9 Documentation

**9.1** 9.1 The following documentation shall be available to assist in product selection and installation, and is available for download at <https://starlinepower.com/resource-library>:

**9.1.1** High Amperage Open Channel Track Busway Product Brochure (in development)

**9.1.2** Operation, Installation, and Maintenance Manuals

**9.2** Product drawings shall be rendered and provided at the time of ordering

# T5 DoubleBar Systems

## INSTALLATION INSTRUCTIONS

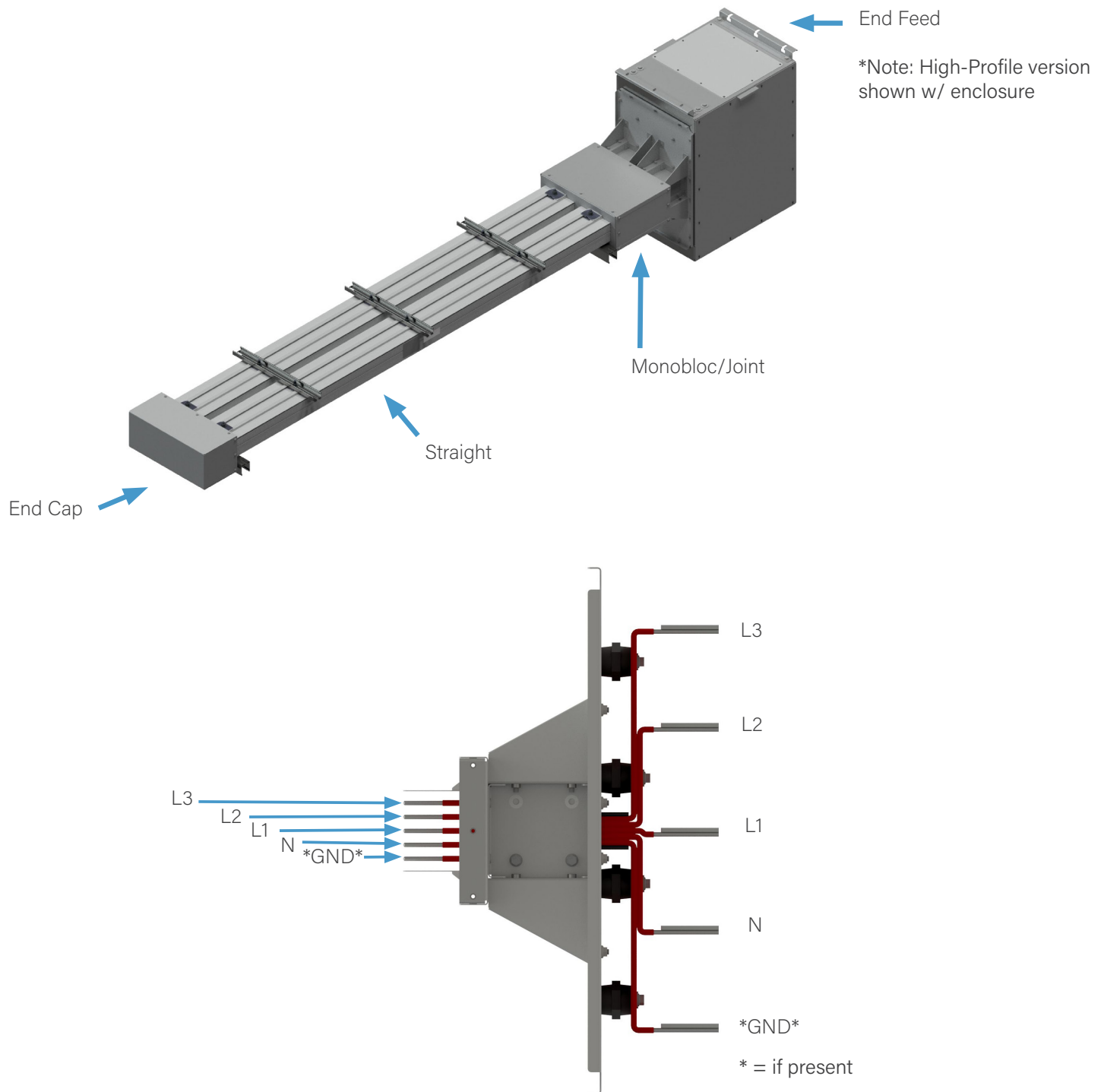


### Section 2: Installation Instructions

# T5 DoubleBar Systems

## INSTALLATION INSTRUCTIONS

### BUSWAY SYSTEM & PHASING VIEW



# T5 DoubleBar Systems

## INSTALLATION INSTRUCTIONS

### STEP 1 - MECHANICAL INSTALLATION (REFER TO PAGE 12 FOR VISUAL)

#### Tools & Materials Required:

- Lifting equipment capable of lifting at least 500lbs (225 kg) of material at a length of up to 10ft (3m) as high into the air as dictated by the site
- Socket/wrench,  $\frac{3}{4}$ " (19 mm) [for monobloc bolts, strut hanger bolts and/or lug mounting bolts]
- Socket/wrench, 10 mm [for monobloc cover]
- Hex/Allen Socket, 3 mm [for EF lids/gland plate screws and monobloc locating screws]
- Torque wrench
- Dead blow hammer or rubber mallet [for fine positioning of the monobloc within a joint]
- Block of wood [for protecting monobloc elements from direct blows from a hammer, if used for fine positioning]
- Threaded rod, Unistrut and/or other mounting hardware (NOTE – these items are NOT provided by Starline)

#### HANGING THE BUSWAY

Prepare to hang/mount busway elements using your desired method. The factory-provided mounting features vary by busway element – see below.

##### Straights

- a. 3x top struts spaced equally across the length of the bus. Each strut accepts/requires 2x  $\frac{1}{2}$ " (M12) all-thread. Note that struts may be relocated across the busway length, but the busway MUST be supported by the building infrastructure every 5ft (1.5m) maximum.
- b. 2x bottom struts located at both ends of the busway housing. Each strut accepts/requires 2x  $\frac{1}{2}$ " (M12) all-thread. Note that the busway MUST be supported by the building infrastructure every 5ft (1.5m) maximum, so if the bottom struts are used to mount the busway you must also use either [1] one (1) of the top struts or [2] an additional bottom strut in the middle of the straight (ordered separately).

##### End Feeds

- a. 2x top mounted hangers along the front & rear edge of the enclosure. Each hanger has three (3) different positions to accept  $\frac{1}{2}$ " (M12) all-thread in. A minimum of one (1) position on each hanger must be used.

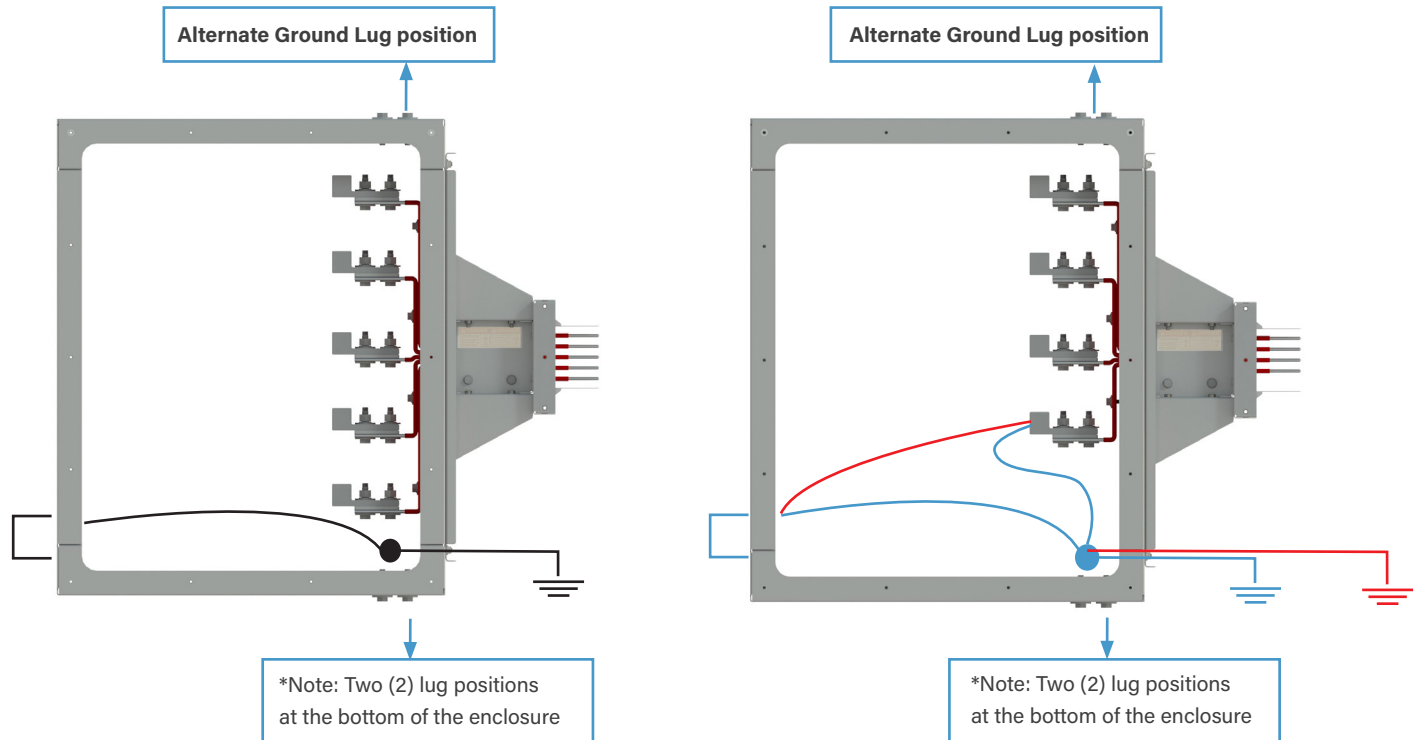
Hang/mount the busway elements, ensuring each busway element is level in both directions and with neighboring busway elements. **IMPORTANT** – when installing straight sections, be sure to note the direction of the polarizing/phase indicator stripes. The stripes indicate which direction the Starline tap-off units (TOUs) will face.



# T5 DoubleBar Systems

## INSTALLATION INSTRUCTIONS

### GROUND OPTIONS



#### Case Ground (shown using black wires)

Uses aluminum busway housing (no extra/ dedicated ground busbar)

#### Isolated Ground (shown using red wires)

Provides an extra busbar/conductor for ground in addition to the busway housing but ARE NOT connected together in the end feed (ISO GND is carried back to the panel by a separate conductor)

#### Dedicated Ground (shown using blue wires)

Provides an extra busbar/conductor for ground in addition to the busway housing and ARE connected inside of the end feed (therefore are at the same electrical potential)

### STEP 2 - ELECTRICAL INSTALLATION

#### Tools & Materials Required:

- Socket wrench,  $\frac{3}{4}$ " (19 mm) [for M12 lug mounting bolts]
- Hex/allen socket,  $\frac{1}{2}$ " [for box-style mechanical lugs, if applicable]
- Hex/allen socket, 3 mm [for EF lids/gland plate screws]
- Torque wrench
- Cable lugs (if the optional box-style mechanical lugs are NOT ordered from Starline)
- Cables, conduit, conduit fittings and/or other electrical hardware (NOTE – these items are NOT provided by Starline)

# T5 DoubleBar Systems

## INSTALLATION INSTRUCTIONS

### MAKING ELECTRICAL CONNECTIONS VIA END FEEDS

End Feeds (EFs) provide the connection point for cables to be landed to each of the phase conductors in the busway. The type, size and quantity of cables is dictated by electrical code(s) in force at the site and/or the installer. For all versions of the busway, the enclosure/housing should be grounded for safety and proper performance. Note that the busway housing is listed by UL for use as a ground conductor. Extension of this ground to the customer's equipment should be done in a manner to comply with the National Electric Code or other in-force electrical code. Isolated and dedicated ground systems provide a separate, additional ground connection point.

The busway end feeds can accept conduit/cable entry points on the top, bottom and/or front of the enclosure through the removable aluminum gland plates. Remove gland plate(s), drill/punch holes as needed, secure conduit fittings, then reinstall gland plate(s) torquing all fasteners to 36 in-lbs (4Nm). Pull cables into the feed and land them to the appropriate phases/busbars using the Starline-supplied M12 lug hardware. **IMPORTANT** – “shorting bars” that connect like parallel phases together (e.g. both L1 phases) are pre-installed from the factory must be present in the final installation. For landing ground to the busway enclosure, install the supplied box-style mechanical lug in any of the four (4) provided positions. For enclosed end feeds, positions are available in each of the corners of the enclosure closest to the busbars. For flange-only end feeds, two (2) positions are available on each the upper and lower half of the flange. Torque all M12 lug hardware to 125 in-lbs (14Nm). If using the Starline-supplied box-style mechanical lugs, torque the connections to 500 in-lbs (56.5 Nm) per the manufacturer's specifications.

Commission the busway system to ensure proper installation. Starline offers installation support and services to ensure proper installation to confirm/extend product warranty. Contact your local Starline sales representative for more information if desired.



# T5 DoubleBar Systems

## INSTALLATION INSTRUCTIONS

### INSTALLING AN ELECTRICAL JOINT CONNECTOR (MONOBLOC)

#### Option 1 - Monobloc Pre-Installed onto a Busway Straight (End-Loading)

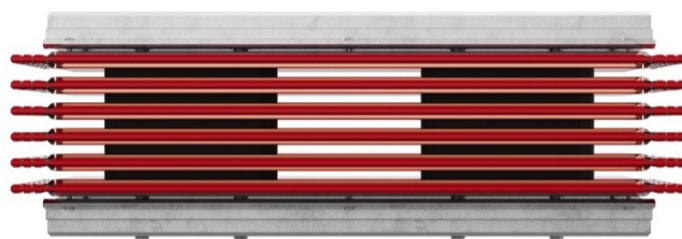
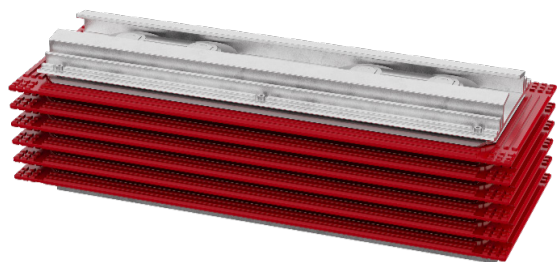
Monoblocs can be ordered from the factory pre-installed onto one end of a busway straight (or, if ordered separately, they can be pre-installed in the field onto a busway element). To make a joint connection to an adjoining section:

1. Ensure the adjacent busway elements to be joined are level and on the same vertical plane.
2. Loosen the four (4) monobloc M12 nuts to allow the monobloc elements freedom to align to the adjacent section's busbars. The four (4) factory-installed M3 monobloc locating screws may also be loosened if needed.
3. Slide the adjacent sections together, ensuring that the monobloc layers align with the busbars and ground tabs of the incoming section.
4. The monobloc is properly installed when the four (4) pin holes in the top/bottom monobloc covers align with the slots in the bare aluminum ground tabs. NOTE – a hammer/mallet may be used to gently tap the monobloc into its final position if needed. However, do NOT strike the monobloc assembly directly. Use a block of wood or similar to protect the monobloc components. As an optional measure, four (4) additional M3 monobloc locating screws (included) may be installed to further verify proper alignment of the monobloc with the mating section.

#### Option 2 - Monobloc Installed after Busway Elements are Mounted (Side-Loading)

Busway elements can be installed without monoblocs, then monoblocs are inserted from the side of the busway to complete the electrical connection between adjacent elements. To do this:

1. Ensure the adjacent busway elements to be joined are level and on the same vertical plane.
2. Ensure the space between the ends of the busbars is 1.5 ±.
3. Loosen the four (4) monobloc M12 nuts to allow the monobloc elements freedom to align to the adjacent section's busbars.
4. Align the monobloc layers with the busbars and ground tabs of both sections, then slide the monobloc into position.
5. The monobloc is properly installed when the four (4) pin holes in the top/bottom monobloc covers align with the slots in the bare aluminum ground tabs. As an optional measure, eight (8) M3 monobloc locating screws (included) may be installed to further verify proper alignment of the monobloc with both sections. NOTE – a hammer/mallet may be used to gently tap the monobloc into its final position if needed. However, do NOT strike the monobloc assembly directly. Use a block of wood or similar to protect the monobloc components.



# T5 DoubleBar Systems

## INSTALLATION INSTRUCTIONS

### INSTALLING AN ELECTRICAL JOINT CONNECTOR (MONOBLOC) (CONTINUED)

After the electrical joint connection is made (using either Option 1 or Option 2), torque the four (4) M12 monobloc nuts to 40 lb-ft (54 Nm) in an alternating pattern, starting with the inner two (2) nuts then the outer two (2) nuts. Repeat the process a second time, this time tightening the four (4) M12 monobloc nuts to 80 lb-ft (108 Nm) in the same alternating pattern, starting with the inner two (2) nuts then the outer two (2) nuts.

**NOTE** – within the monobloc area, each end of a busway straight section has eight (8) M10 fasteners that are accessible by the customer/installer through oval slots in the bare aluminum ground tabs. These are installed at the factory and are marked to ensure proper torque was applied. Do NOT retorque these connections during initial installation (checking torque on these as part of a preventative maintenance plan may be required – see the Busway System Maintenance section for more information).

Once the monobloc nuts are properly torqued, install the joint covers (2x side, then 2x top/bottom) using the supplied M6 hardware (24 places). Torque to 70 in-lb (8 Nm).

### Installing an End Cap

End caps should be installed at the end of every busway run to cover and protect the exposed busbar conductors. To install, slide the open end of the end cap assembly over the busbar conductors and onto the busway housing flange. Secure the end cap assembly to the busway housing flange using the supplied M6 hardware (12 places). Torque to 70 in-lb (8 Nm).

# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

### Section 3: Plug-In Insertion Instructions

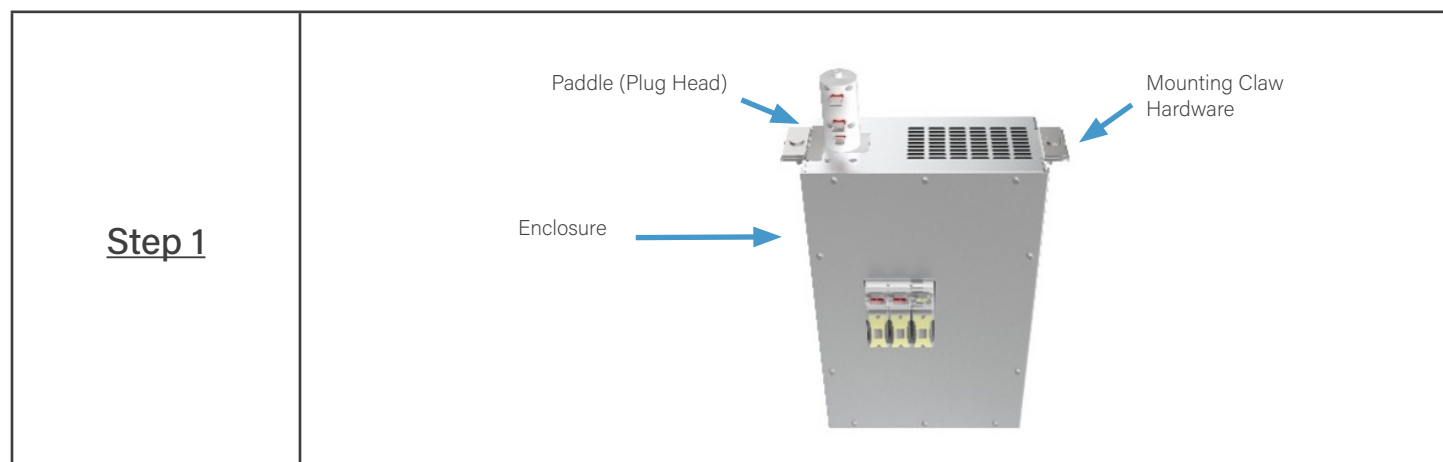
# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

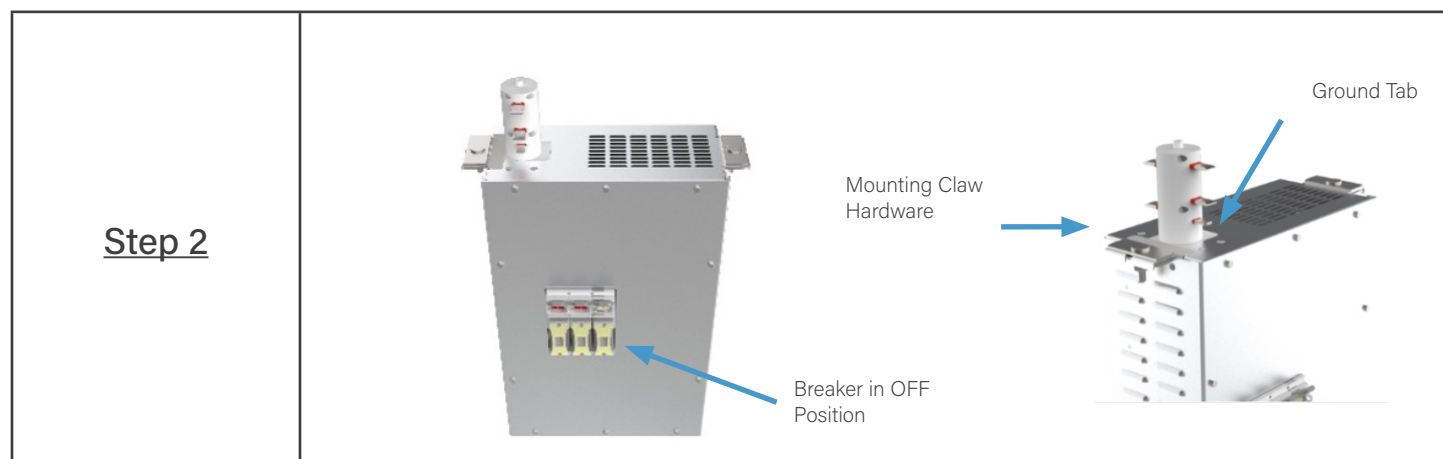
### INSTALLING A PLUG-IN UNIT

#### Before You Begin

- Always wear appropriate PPE
- Please consult your local electrical code for information on calculating incident energy for the location of your work, and the necessary associated PPE for your particular installation.



**DO NOT** install Plug-in units under load. Make sure breakers are in the off position



# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

### Step 3

Plug installation on DoubleBar can only be installed in a staggered or back-to-back formation. The breakers must be accessible.



Staggered



Back-to-Back

### Step 4

Guide the paddle head of the first plug into the access of slot of the back busway run and insert the plug completely into the busway.



### Step 5

Rotate so that the blades engage the busbars.

Push the enclosure firmly up against the busway.

(Hint: push UP against the busway as you begin to rotate.)



# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

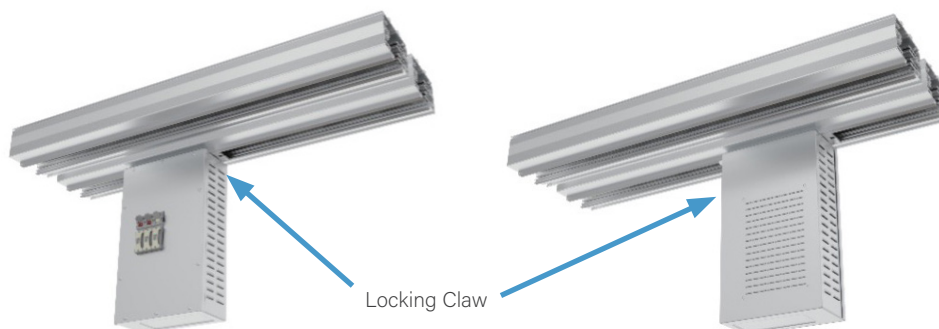
### Step 6

Rotate plug-in to the right until it is parallel to the busway.  
The typical circuit breaker/receptacle faces the direction of the polarizing strip for the T5 systems.  
Engage lever to operate the mounting claw.



### Step 7

Rotate locking lever to secure the locking claw.



### Step 8

Guide the paddle head of the second plug into the access slot of the front busway run and insert the plug completely into the busway.



# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

### Step 9

Rotate so that the blades engage the busbars.

Push the enclosure firmly up against the busway.

(Hint: push UP against the busway as you begin to rotate.)



### Step 10

Rotate plug-in to the right until it is parallel to the busway.

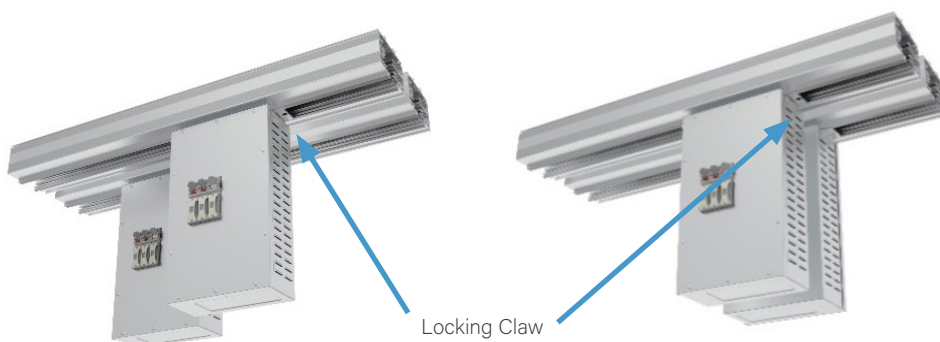
The typical circuit breaker/receptacle faces the direction of the polarizing strip for the T5 systems.

Engage lever to operate the mounting claw.



### Step 11

Rotate locking lever to secure the locking claw.



# T5 DoubleBar Systems

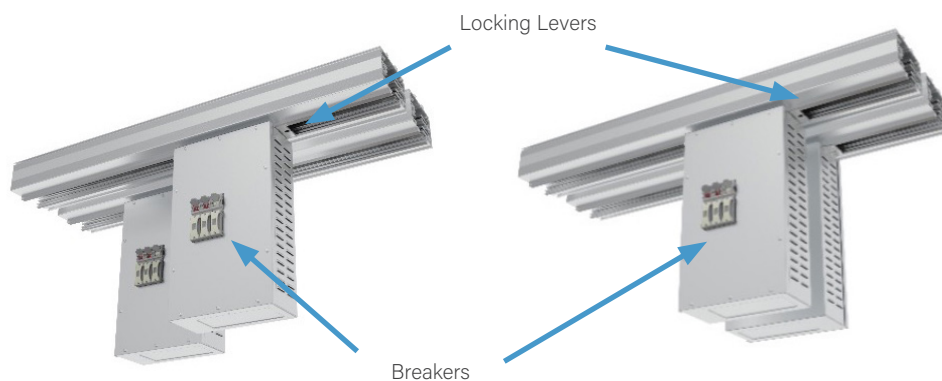
## PLUG-IN INSERTION INSTRUCTIONS

### REMOVING A PLUG-IN UNIT

#### Step 1

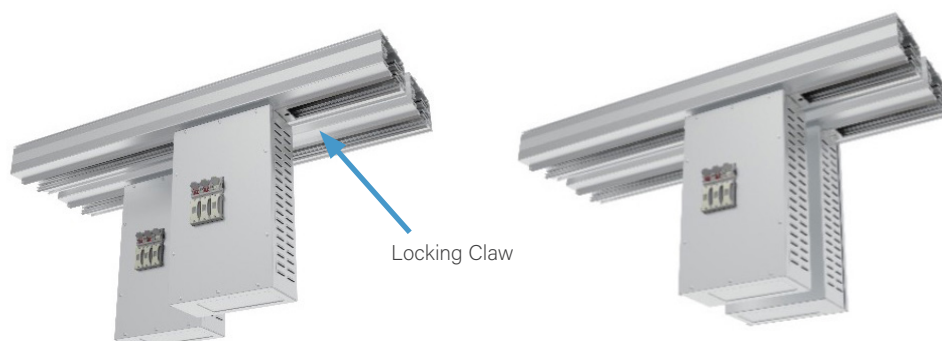
Put breakers in OFF position and disengage locking levers on front plugs.

DO NOT remove under load.



#### Step 2

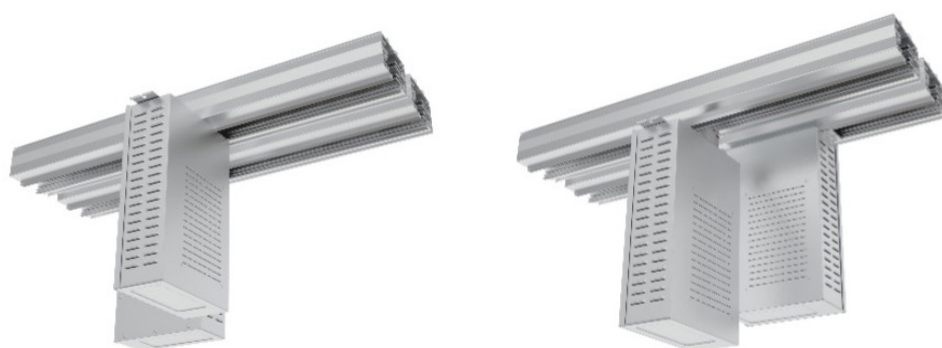
Rotate operating handle down, retracting locking claw mechanism.



#### Step 3

Rotate the enclosure 90 degrees and pull down until the paddle is clear of the busway.

Repeat steps 1-3 for instructions on how to remove the back plug.



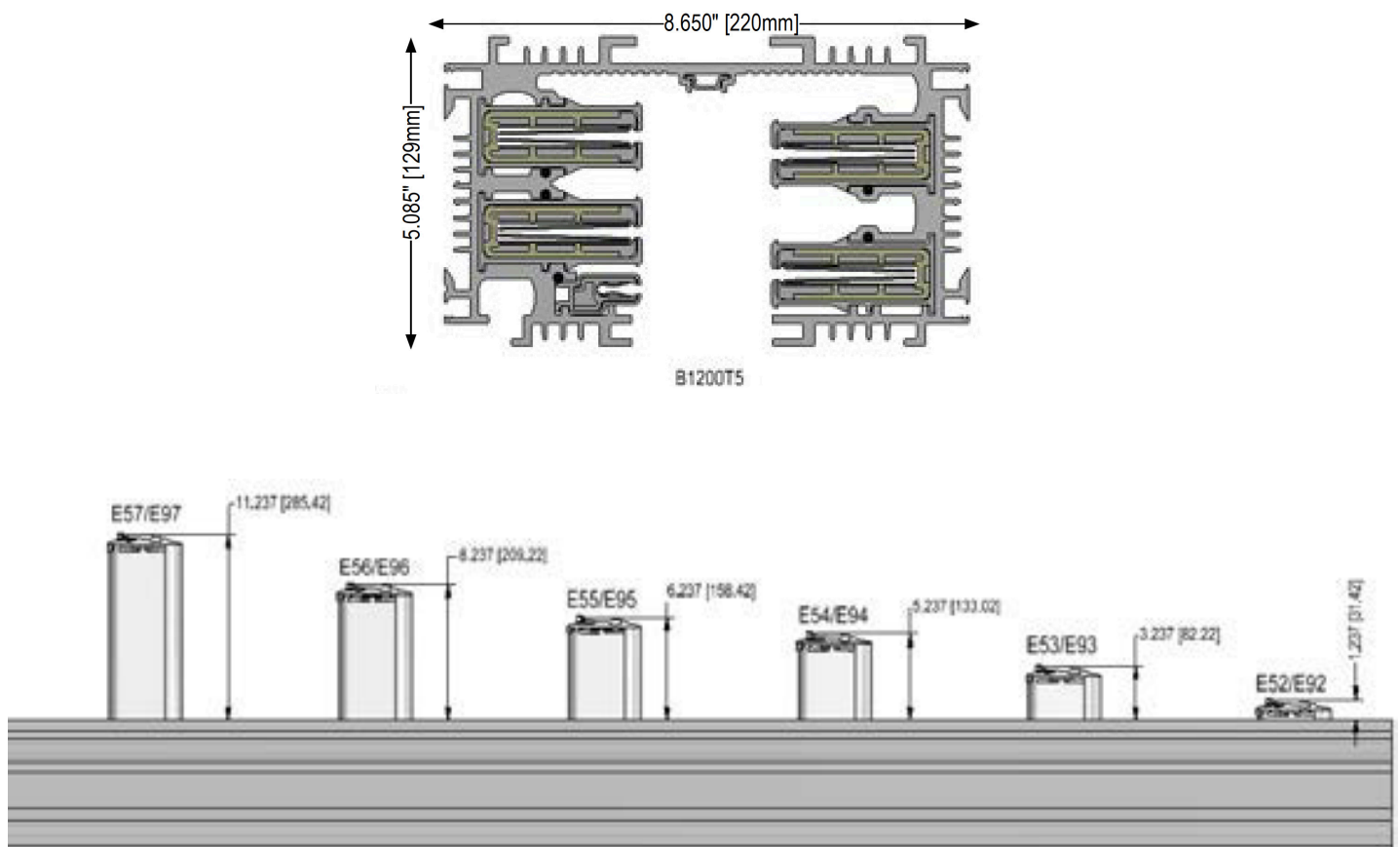
# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

### PLUG-IN DISTANCE CLEARANCES

#### Side Distance Clearance

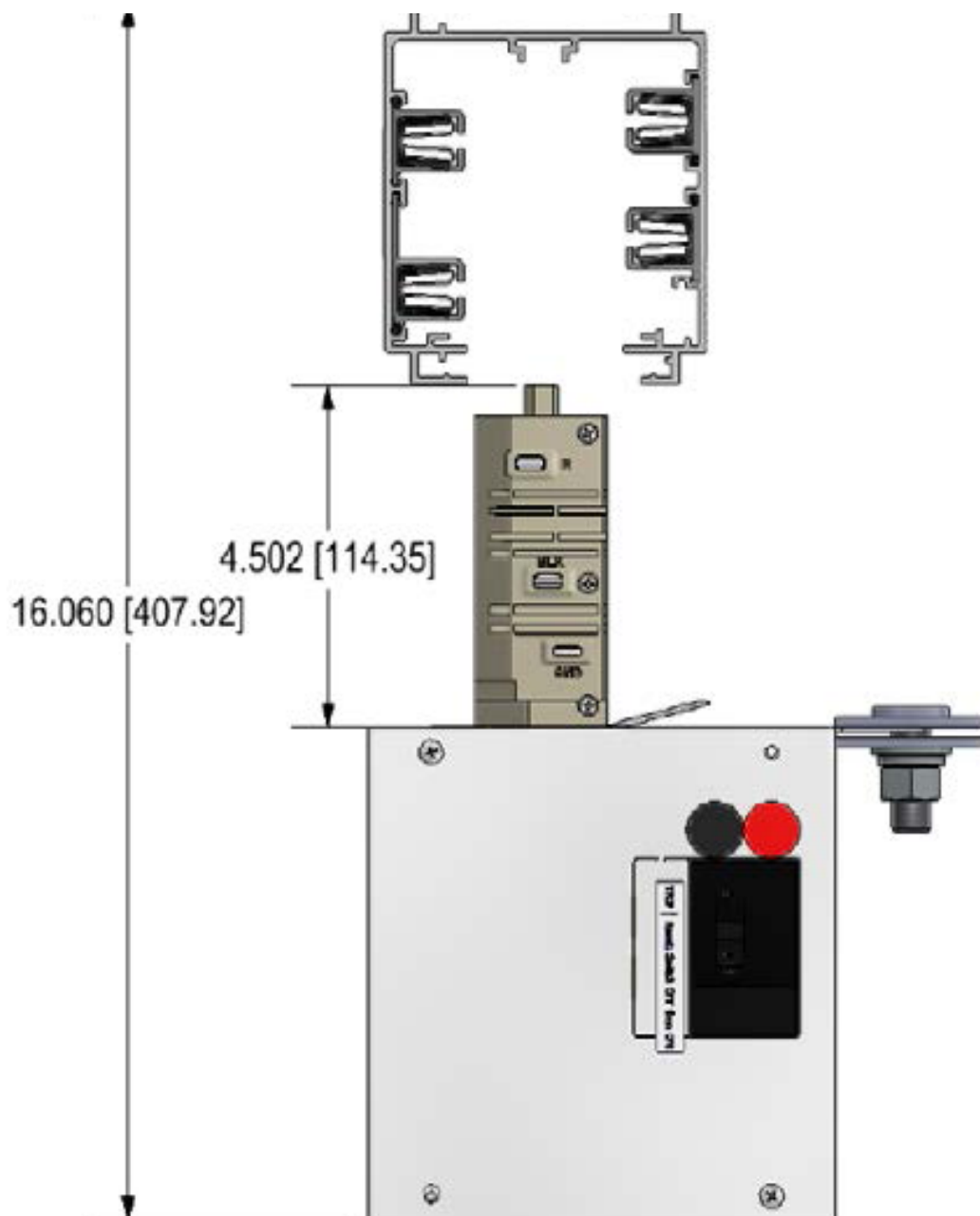
The following tech brief shows the side and height clearances of standard Starline enclosures.



# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

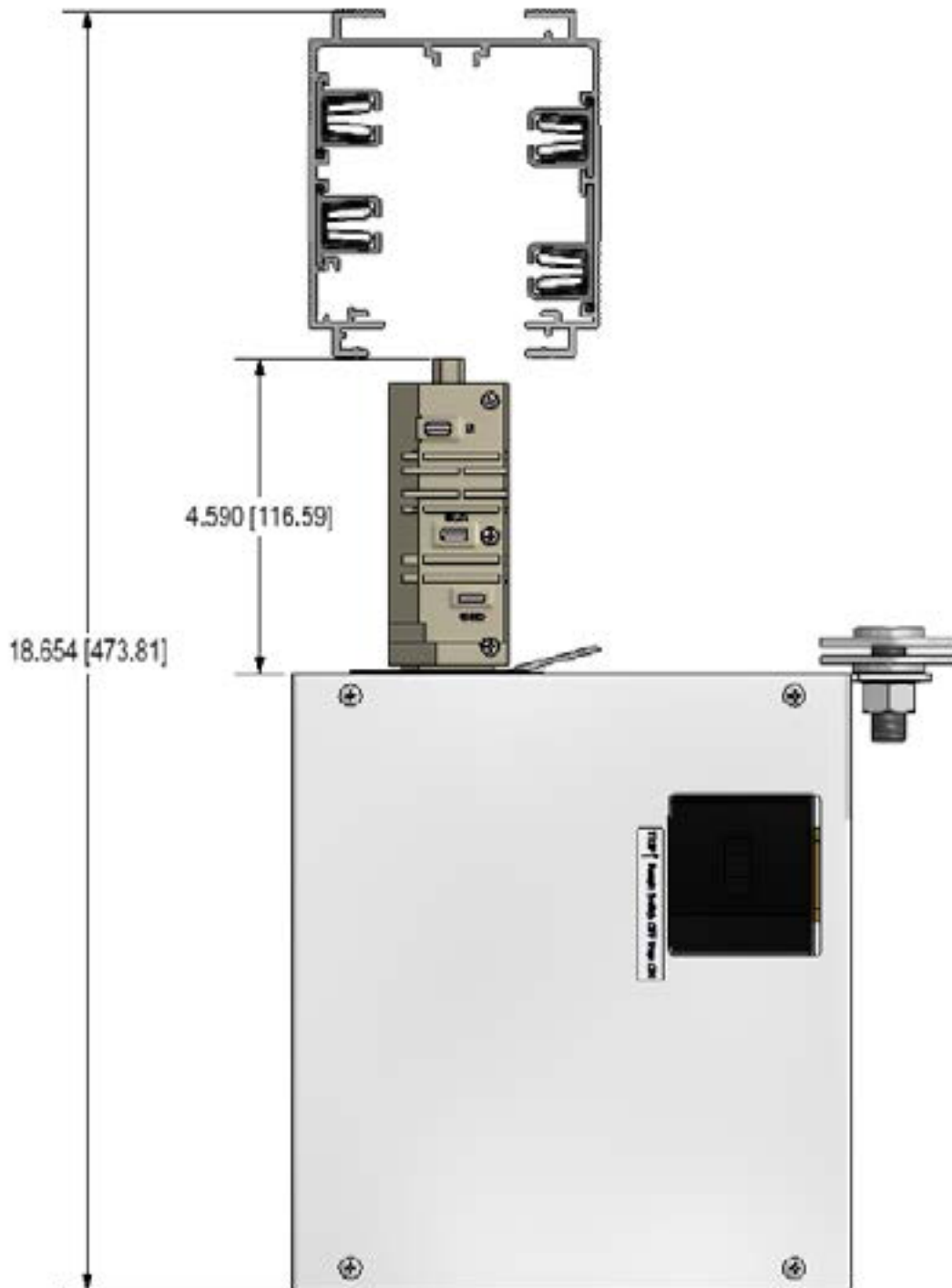
### Enclosure E12



# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

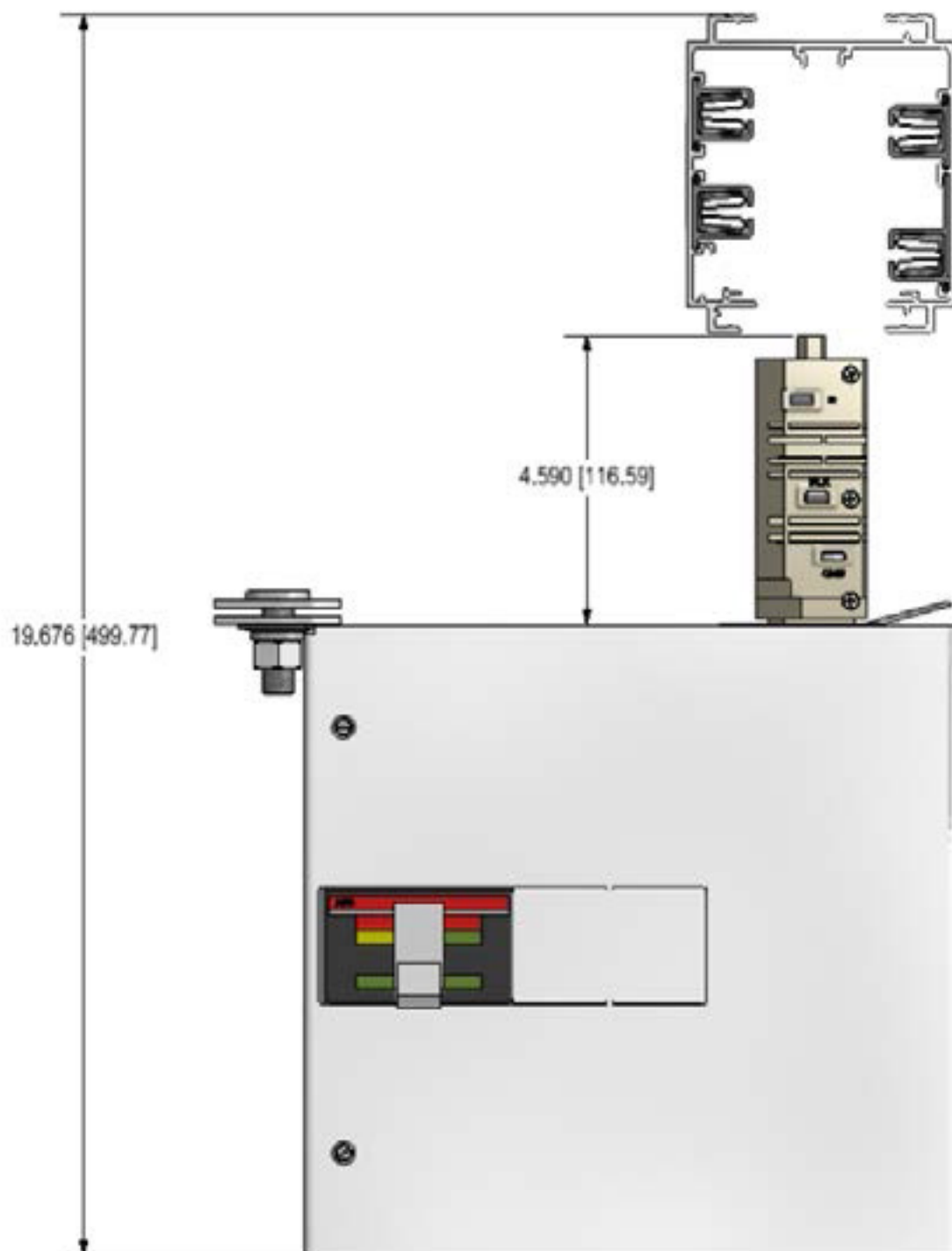
### Enclosure E28



# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

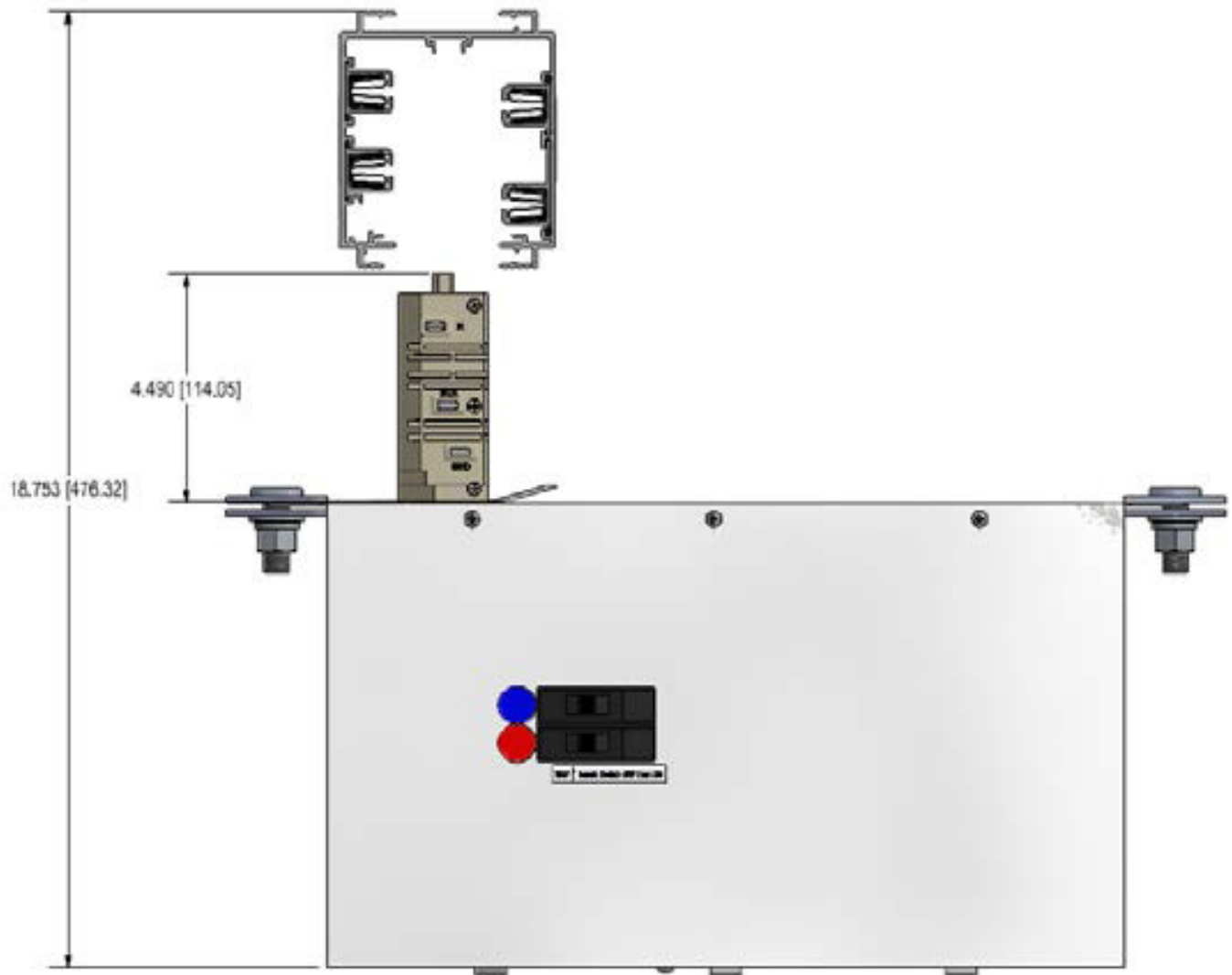
### Enclosure E36



# T5 DoubleBar Systems

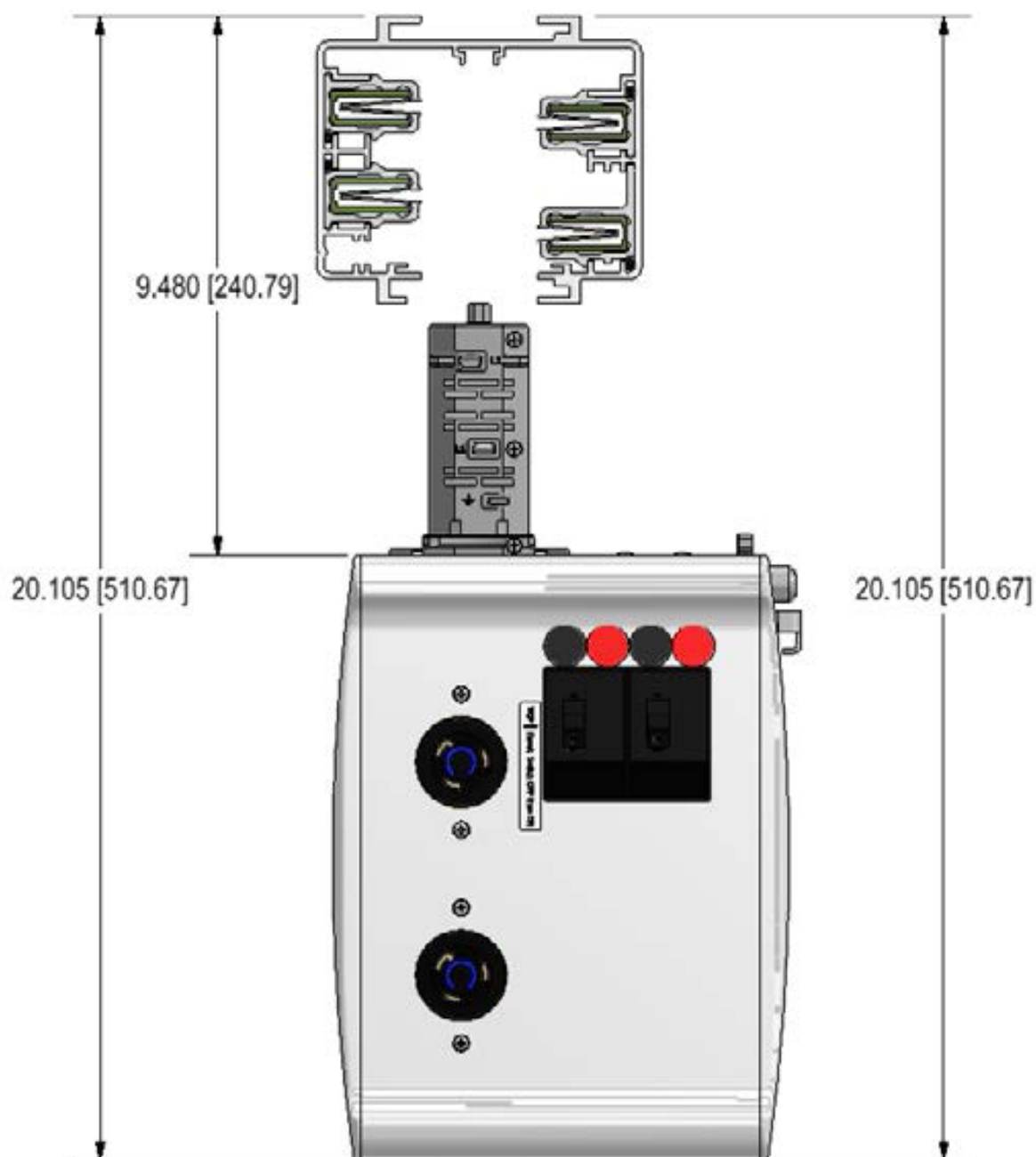
## PLUG-IN INSERTION INSTRUCTIONS

### Enclosure E25



# T5 DoubleBar Systems

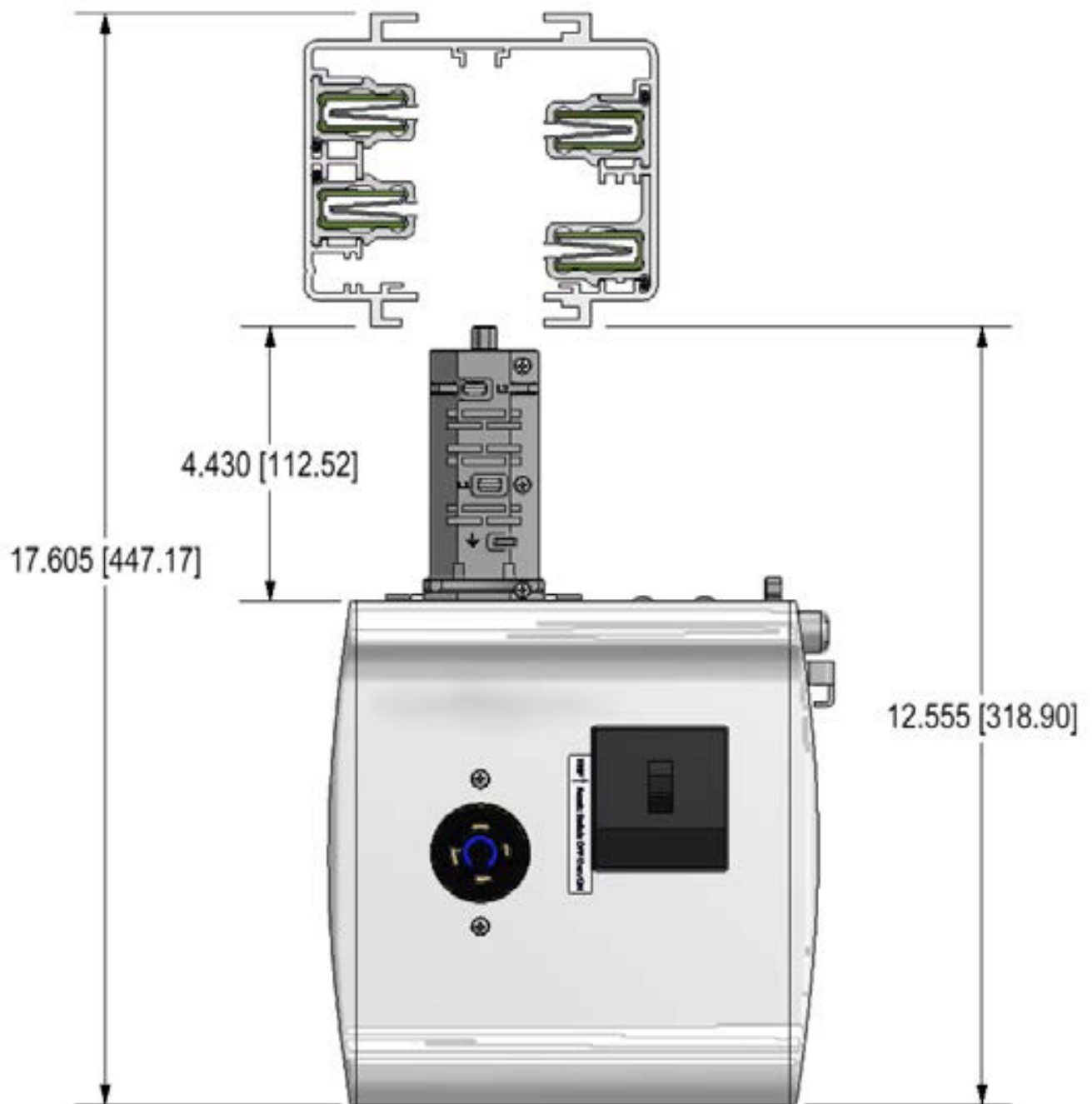
## PLUG-IN INSERTION INSTRUCTIONS



E50 Series Plug Shown

# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS



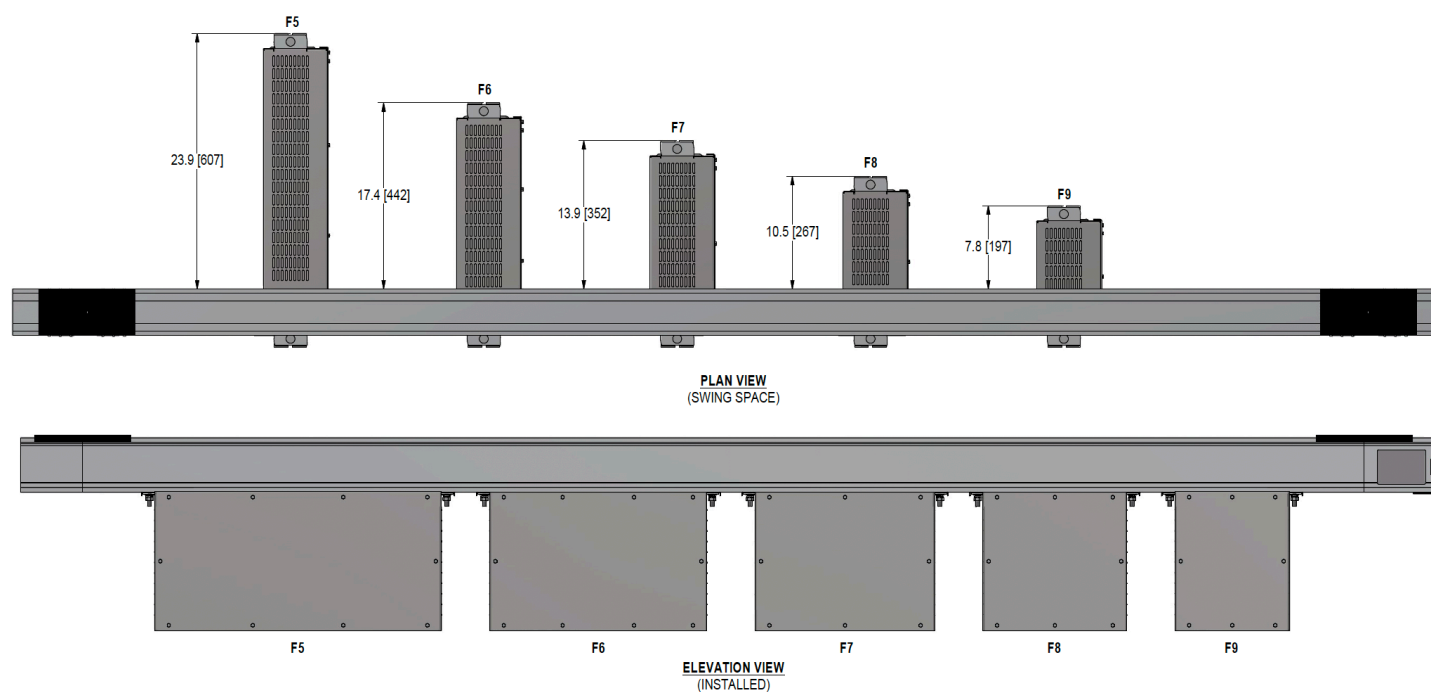
E90 Series Plug Shown

# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

### Side Distance Clearance

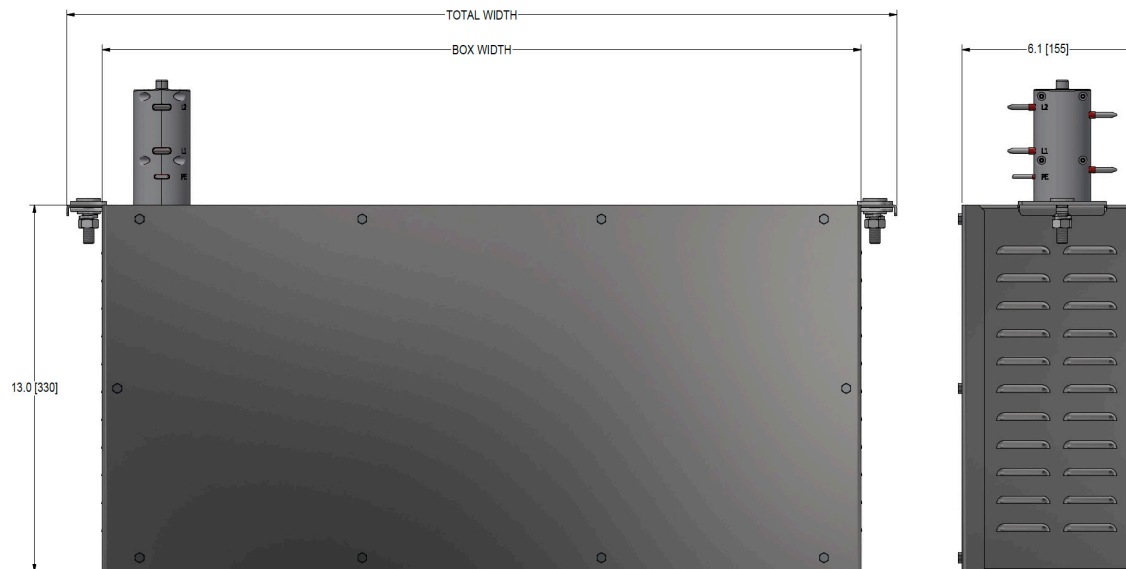
The following tech brief shows the side clearances of Type 1 Starline enclosures.



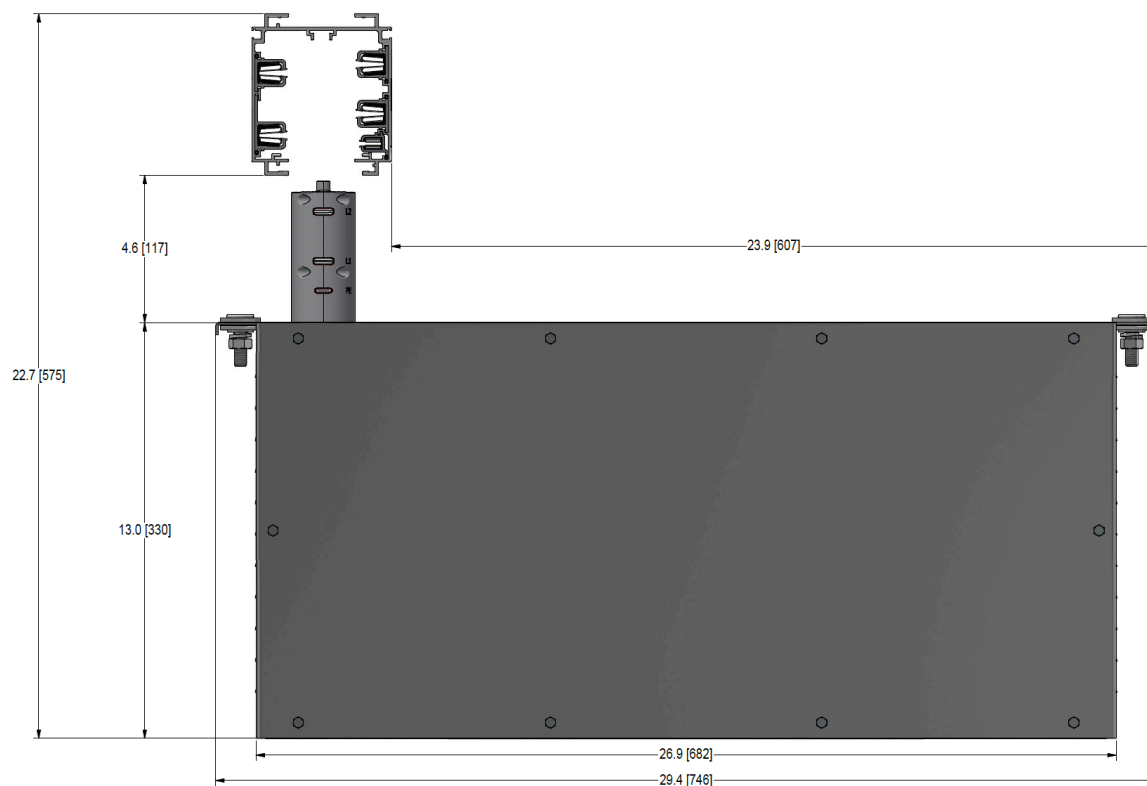
# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

Enclosure Type 1



Enclosure Type 1 F5

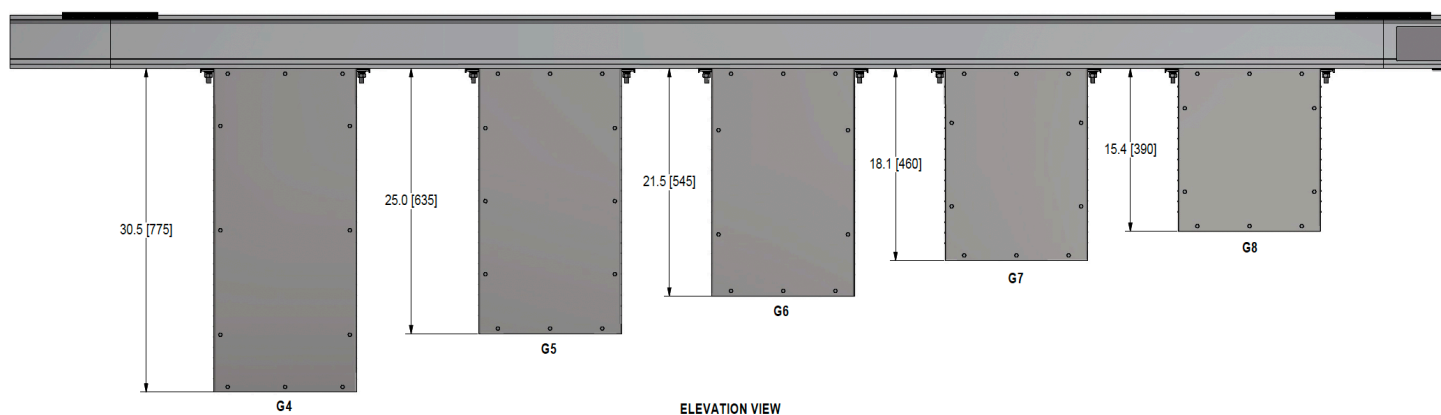


# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

### Height Distance Clearance

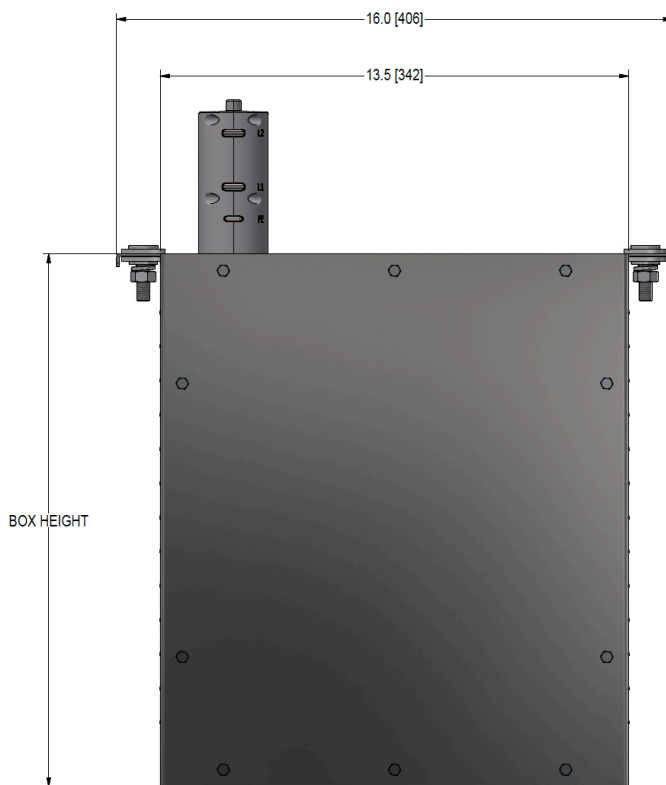
The following tech brief shows the height clearances of Type 2 Starline enclosures.



# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

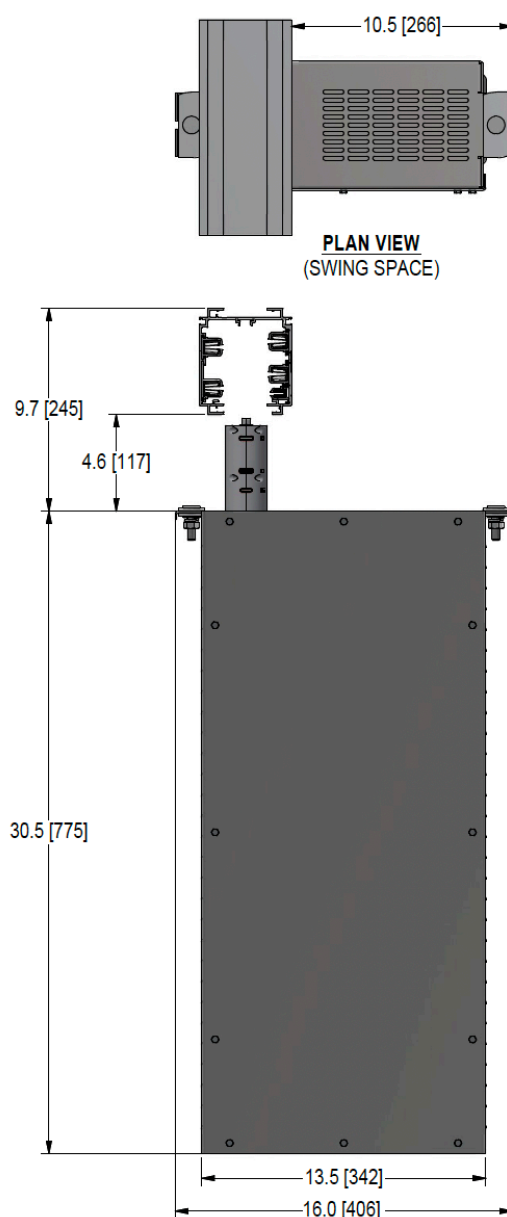
Enclosure Type 2



# T5 DoubleBar Systems

## PLUG-IN INSERTION INSTRUCTIONS

### Enclosure Type 2 G4



# T5 DoubleBar Systems

FIELD SERVICES AND WARRANTY

## Section 4: Field Services and Warranty

# T5 DoubleBar Systems

## FIELD SERVICES AND WARRANTY

### STARLINE SERVICES

Regular servicing of busway systems is crucial for ensuring that your system performs at its best. By conducting regular maintenance, you can identify and address any potential issues before they turn into expensive problems, thus saving you time and money in the long run. Regular servicing can help extend the lifespan of your busway system, ensuring that it meets safety standards and complies with regulations. Choose from various offerings and customize a service plan that works best for you.

### WE CURRENTLY OFFER THE FOLLOWING SERVICES:

#### COMMISSIONING AND EQUIPMENT RENTALS

Designing a mission-critical facility involves a significant investment of time and money. Through comprehensive commissioning services, Starline can help guarantee your project delivers the outcomes you expect.

Whether you need rental equipment to test your busway system or certified technicians to perform the testing, Starline has you covered. Choose from our inventory of load bank tap-offs and associated gear, or work with a Starline Engineer to customize and perform a commissioning plan to fit your specific needs.

#### METER SERVICES

Starline's certified technicians make optimizing your meters' performance and functionality simple. Our comprehensive on-site meter programming service includes inspecting, programming, reporting, and optional retrofitting services for you existing systems.

#### STARTUP AND SYSTEM CERTIFICATION

At Starline, we are committed to ensuring the success of your project. Our team understands the risks associated with the energization of systems, which is why we've designed a rigorous certification process to inspect, test and report on your Starline Busway and Critical Power Monitor ("CPM") products. Our certification process proactively identifies and prevents any potential issues before they happen.

To ensure the long-term success of your project, it is crucial to have Starline-certified technicians inspect and validate the installation before full commissioning. Level 2 and 3 commissioning ensures the installation complies with safety requirements and meets factory standards for ongoing reliability.

- Double the length of the standard factory warranty
- Ensure all joint and feed connections are properly installed with continuity testing
- Ensure proper installation of all plug-in units
- Validate that system will perform to your specified requirements
- Full certification report delivered electronically at conclusion of service

# T5 DoubleBar Systems

## FIELD SERVICES AND WARRANTY

### STARLINE SERVICES

#### TURNKEY INSTALLATION SERVICES

Our trained and factory certified Busbar installers are looking forward to completing your next job. You can order your best-in-class power distribution system and leave the rest to us. Our technicians will complete your installation quickly and safely and will reduce your TCO by extending your product warranty.

#### PREVENTATIVE MAINTENANCE PLANS AND IR SCANNING

Although Starline busway is expertly designed to require less maintenance, NETA ATS and MTS guidelines recommend conducting annual inspections and health assessments on all critical equipment. Yearly preventative maintenance helps to ensure your system's long-term reliability and safety.

Starline's FLIR-certified technicians will create a custom preventative maintenance plan for your specific needs.

Our certified technicians will work to:

- Identify thermal anomalies
- Extend equipment lifecycle
- Ensure optimal system performance
- Improve facility safety and operational sustainability

Upon completing your preventative maintenance plan, you may be eligible to extend your product warranty.

#### ON-SITE INSTALLATION SUPPORT

Starline's on-site installation service makes installing your busway as quick and easy as possible. Our installation support starts with scheduling a preliminary trip to the installation site. During the initial visit, our certified technicians will train your installing contractor and develop a thorough installation and commissioning plan.

After completing the training, your installing contractor will have a direct line of communication with our installation experts. Our experts can help answer questions and provide hands-on guidance when needed. Opting for Starline's installation support helps mitigate the installation risk and reduces the learning curve typically associated with new installations.

Contact your Starline Representative today to add services to your Track Busway order, or download the detailed Statement of Work documents at [downloads.starlinepower.com/services](https://downloads.starlinepower.com/services)

# T5 DoubleBar Systems

## FIELD SERVICES AND WARRANTY

### STARLINE SERVICES

#### ON-SITE PRODUCT TRAINING

At Starline, we offer comprehensive on-site product training services facilitated by our team of certified technicians. With their extensive expertise and commitment to upholding our high factory standards, you can confidently rely on them to ensure your and your systems' reliability and operational safety.

Our training programs equip your team with the knowledge and skills necessary to operate and maintain your systems effectively. Through hands-on demonstrations and interactive sessions, our certified technicians will guide your staff in understanding the intricate workings of the products and address any questions or concerns your team may have during the training process.

By choosing our on-site product training services, you are investing in your system's and operations' long-term success.

#### RECERTIFICATION AND EXTENDED WARRANTY PLANS

Starline's recertification and extended warranty options provide best-in-class coverage for all of your Starline products and systems. Our extended warranty plans safeguard your investment beyond the standard warranty timeframe, offering you peace of mind while our recertification programs help mitigate risk and downtime. Whether the busway has been installed for years or you are relocating to another building, Starline is here to help.

Choose from one of our flexible one to four-year plans or have your system recertified anytime. Contact your Starline rep for more information.

Contact your Starline Representative today to add services to your Track Busway order, or download the detailed Statement of Work documents at [downloads.starlinepower.com/services](https://downloads.starlinepower.com/services)

# T5 DoubleBar Systems

## FIELD SERVICES AND WARRANTY

### STANDARD FACTORY WARRANTY

Contractor/Customer: \_\_\_\_\_

Customer Order: \_\_\_\_\_

Seller warrants all products sold by Starline Holdings, LLC to be free from defects in material or workmanship for a period of one year from the date of shipping. Seller's liability on this warranty shall be limited to the repair or replacement of any product which is returned to the Seller, within one year of the date of delivery and which is found by the Seller to be defective in material or workmanship. Customer must have written authorization prior to returning any material to Starline. The Buyer will be responsible for the cost of removing and reinstalling a defective part(s) or its replacement and all labor and material and all other costs or expenses incurred in connection therewith.

Notwithstanding any provision contained herein to the contrary, (i) Buyer's use of any plug-ins, parts and/or components that are not manufactured by Starline with the Products, and/or (ii) if any services and/or warranties are provided by any person/entity other than Starline without Starline's prior written consent, all warranties for all Products shall immediately terminate and be null and void.

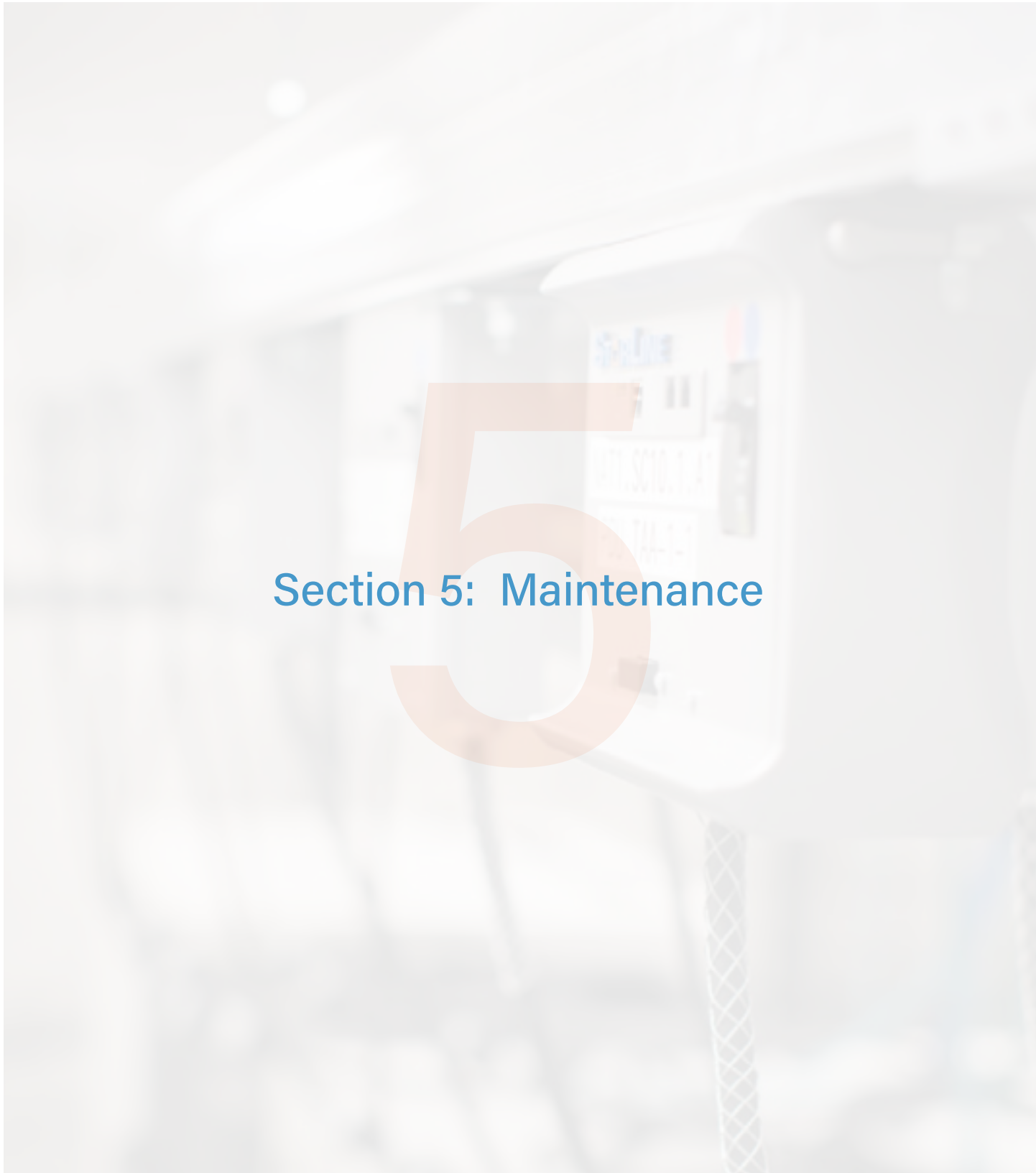
Warranty Period: 1 year from delivery date

### Standard Factory Warranty Process

1. Customer calls either Starline Rep or Starline direct.
2. Customer Service Specialist will issue Return Material Authorization (RMA).
3. Customer returns warranted item along with copy of RMA.
4. Starline will either rework item or manufacture new item depending on the customer needs.
5. Starline ships item back to customer.
6. Starline will determine reason for failure.
7. Corrective action will be documented.
8. If reason for failure is requested by customer. Starline will send report to customer.
9. All action items from corrective action report must be completed by assigned designer and returned to Quality Department.
10. Quality Assurance Department will track all warranted events and report them to Starline Managers, Directors, and the Executive Team.

# T5 DoubleBar Systems

## MAINTENANCE



### Section 5: Maintenance

# T5 DoubleBar Systems

## MAINTENANCE

### STARLINE BUSWAY RECOMMENDED MAINTENANCE

Starline Track Busway is designed to be user friendly with no mandatory maintenance required. The joints, end feeds, and plugs also require little to no maintenance. Starline Track Busway uses a boltless connection for the joining of the copper conductors. The joint design uses a U-shaped conductor channel that utilizes a joint kit to connect two housing sections. This connection is mechanically pressed into the slot with the use of installation tools that can be purchased from Starline. The end result is a reliable, heat-tested connection at every joint that takes little to no maintenance over the life of the product.

The housing couplers, end feed connections, mounting hardware, and hanger bolts can be checked at the user's discretion, but is not required by Starline Holdings, LLC.

IR inspection of the end feed connections, joints, and plug-in units can be conducted at the user's discretion, but is not required by Starline Holdings, LLC.

We do recommend that the system be inspected periodically for physical damage or signs of any abnormalities. Starline conductor insulation systems are produced using performance polymer materials. Therefore, it should be noted that Starline strongly advises against the use of hydrocarbon-based products found in commonly used release sprays & cleaning fluids, due to potential non-compatibility.

Starline offers comprehensive on-going service plans that extend the life of the warranty over the duration of the plan. For more information, contact your Starline sales representative or email the factory at [service@starlinepower.com](mailto:service@starlinepower.com).

- Refer to NEMA bulletin BU1.1 for general maintenance instructions.

## NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

To learn more visit  
**starlinepower.com**

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