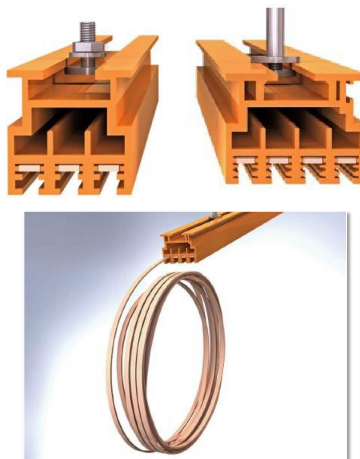


ENGINEERING SPECIFICATIONS
SOLID STATE CRANE ELECTRIFICATION SYSTEMS

US-SAFETY TROLLEY
TRI-BAR®/FOUR-BAR® SYSTEMS



U-S SAFETY TROLLEY
A DIVISION OF UNIVERSAL ELECTRIC CORPORATION

SECTION [XXXXXX]

CRANE ELECTRIFICATION

US-SAFETY TROLLEY – TRI-BAR®/FOUR-BAR® SYSTEMS

PART 1 GENERAL

1.01 SCOPE

- A. The installing contractor shall furnish and install the US-Safety Trolley Tri-Bar®/Four-Bar® solid state system including all necessary fittings, hangers and accessories as specified herein and as shown on the installation drawings.
- B. The trolley system shall be of such design that expansion joints will not be required for satisfactory operation, except at points in conjunction with building expansion joint locations.
- C. The trolley system shall be used to provide moveable electrical power as shown on the approval drawings.

1.02 APPLICABLE STANDARDS

- A. Trolley systems components shall be designed, manufactured and tested in accordance with the latest applicable following standards of NEC, ANSI, and NEMA.
- B. Installing Contractor shall adhere to NEC, OSHA, State, and Local safety guidelines, laws, rules, and regulations.
- C. All electric equipment shall be either UL, CSA c/us, ETL, or CUL listed.
- D. Installing Contractor/personnel shall conform to all applicable ANSI, CMAA, and HMI specifications and/or standards.
- E. All conductors, components and hardware must be manufactured and supported in the USA.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Equipment shall be handled and stored according with manufacturer's instructions.

PART 2 PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. US-SAFETY TROLLEY, a Division of Universal Electric Corporation.

Address:

Spanguard Corporation

PO Box 326

14 North Main Street

Tioga, Pennsylvania 16948

Main Telephone number (570)948-2627

2.02 RATINGS

- A. The overhead trolley solid state system shall be US-Safety Trolley, Tri-Bar®/Four-Bar® type and shall be:
 - 1. Voltage: Up to 600VAC and DC
 - 2. Amperage:
 - a. Tri-Bar/Four Bar: 100 and 125 amps
 - b. Collectors: 35, 70, or 125 amps
 - c. Power Pickups: 15, 30, 40 or 50 amps
 - 3. Temperature Ratings: Range from 0°F (-18°C) to 135°F (55°C)
(Consult manufacturer for extreme temperature conditions)
 - 4. Speed: Shall be acceptable up to 1200 feet FPM

2.03 HOUSINGS

- A. Housings shall be modular un design have conductor slots to carry three or four conductor slots. Conductors must be insulated from each other and from ground up to 600VAC and DC.
- B. Each Housing shall provide a continuous slot for a universal mounting hanger, either horizontal or lateral.
- C. Each Housing shall have rigid guideways for three/four head collectors or power pickups collectors.
- D. Housings shall not exceed neither 2 5/8 inches in width and 2 inches in depth.
- E. Housings shall be furnished in 20 foot lengths. Shorter lengths shall be available when actual requirements are not in multiples of 20 feet.

Parallel housings shall be used when more than four bars are required. Additional insulation between housings shall not be required.

2.04 HOUSING WITH CURVATURES

- A. Housings shall be customizable to accommodate unique modular design for customers requiring, but not subject to, curves, loop systems, transfer switches, oval paths, commutator rings, isolated maintenance zones, or similar.
- B. Curves offered for customer requirements must include 90 degrees, 180 degrees, any length and degrees, any radius 18 inches (450mm) or over, horizontal or vertical bends, "S" curves, dog-legs, curve-straight combos, bar facing in/out/down, angle cut, helix curves, etc.

2.05 CONDUCTORS

- A. Each Conductor shall be solid copper conductor copper bar at 100/125 amps continuous carrying capacity and rated up to 600VAC or DC, as specified on approval drawings.
- B. Each Conductors shall be cut to exact length, and free of any splice and/or joints for its entire length of straight runs. Conductors that require splice plates, pins, screws, rivets or similar will not be accepted. NO EXCEPTIONS.

2.06 COLLECTORS

- A. Collectors shall be of pantograph construction, with three/four collector shoes mounted individually on one base. Collectors must be rated at 35, 70, and 125 amps and rated up to 600V as specified on approval drawings
- B. Collectors must be capable to be horizontally or laterally/vertically mounted without the need of counterweights.
- C. Flexible wire leads shall be provided.
- D. Provisions shall be made for maximum horizontal movement of 4 inches and vertical movement of 4 ½ inches to compensate for misalignment. *(Consult the manufacturer for applications that require larger misalignment ranges)*

2.07 POWER PICKUPS COLLECTORS

- A. Power Pickups type collectors shall be self-supported and mount directly onto the housing.
- B. Power Pickups shall be towed by pulling chain or similar means. Additional support shall not be required nor accepted.
- C. Power Pickups shall be provided spring loaded with 2 contact shoes per conductor, and integral terminal box.
- D. Power pickups shall provide a minimum of 5,000 miles of wear life usage.

2.08 HANGERS

- A. Hangers shall be positioned in a continuous slot for universal mounting, either horizontal or lateral with 5 feet mounting space, and shall have rigid guideways for three/four head collectors for power pick-ups.

2.09 ACCESSORIES

- A. System shall provide all necessary hanger bolts, sliding hanger bolts, T-Bar mounting hangers, end feed and/or center feed connectors, end pieces and end caps to make system complete for installation.

2.10 REPAIR SECTIONS

- A. System must be designed to allow splice joints only when necessary. E.g. repair a damaged section, extending an existing runway, or creating an isolated maintenance zone.

PART 3 EXECUTION

3.01 INSTALLATION & INSPECTION

- A. Inspect trolley system for conformance with reviewed approval drawings
- B. Trolley system shall be installed in conformance with manufacturer's instructions and inspected by a manufacturer's representative. Provide all necessary accessories to make system complete, usable, and capable of meeting the operating requirements specified. Test, adjust and clean equipment for acceptance by Owner.

3.02 WARRANTY

- A. Limited Warranty. Equipment manufacturer warrants all products sold by it to be free from defects in material or workmanship for a period of (2) years from the date of delivery, and limited to the obligation set forth in the manufacturer's limited warranty provisions herein.
- B. Extended warranties shall be allowed as specified herein.

3.03 START-UP SERVICES

- A. A factory authorized service representative shall perform all startup and inspection services.
- B. Train Owner's maintenance personnel on procedures for servicing and maintaining trolley system equipment per manufacturer's recommendations.

END OF SECTION