



CABL-BUS Vs. Armored Cable & Tray and Rigid Non Seg Bus Duct

| ISSUES | MPHusky | Armored Cable & Tray | Non Seg Bus Duct |
|--|--|---|--|
| Ratings | Available from 600V to 69KV 800 Amps to 8,000 Amps | Available from 600V to 25KV, based Teck Ratings available 15Amps to ? | Available from 600V - 5,000 Amps <i>5KV and above not readily available</i> and must be custom made. Generally not available at voltages above 5KV. |
| Engineering | Engineered System MPHusky Exclusive - Inductive Reactance Program. Defines for the User and the Engineer the operating characteristics of the Cabl-Bus run: ★ The individual conductor current, Power dissipated per foot and total. ★ Individual phase currents, impedance's and voltage drops. ★ Average phase impedance and total 30 power loss. | Cut & Fit | Engineered System |
| Energy Issues | High Efficiency Phasing arrangements in Cabl-Bus result in lowest losses , therefore lower operating costs . | More cables and less efficient phasing arrangements result in higher losses and higher operating costs . | Less efficient phasing arrangements result in higher losses and higher operating costs . |
| Short Circuit Tests - Fault Bracing | Tests performed up to 120KA RMS Symmetrical, runs certified for up to 100KA RMS Symmetrical. Can provide greater Short Circuit Bracing if required, up to 200KA. | Not Available Tie downs up to contractor. Tie wraps provide limited strength for fault bracing, often insufficient. | Tests performed and runs certified for up to 100KA RMS Symmetrical. |
| Heat Run Tests | Tests performed | Not Available | Tests performed |



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| CSA and UL | CSA Certified. CSA and UL listed cables. | CSA and UL listed cables. CSA and UL listed tray. | CSA and UL listed. |
| Installation Labor | Minimum <ul style="list-style-type: none"> ★ Everything pre-cut to fit specific location. Housing parts are Match Marked to Installation Drawings. ★ Bottom cable support block is factory pre-installed. ★ All hardware is supplied from cable lug to cable lug. ★ Sections weight are similar to cable tray and are relatively light, easily installed with two men. | Maximum Everything is measure, cut and fit. Cable supports need to be purchased and field installed. Sections are the lightest of the three to handle. More cable to be installed than Cabl-Bus, requiring more cable lugs and more stress cone termination kits. | In Between The contractor has pre-manufactured sections that need to be bolted in place, but the sections are the heaviest of the three choices and usually take at least two people per section. Usually requires heavy lift equipment, adding additional costs. |
| Field Modifications | Permitted. <ul style="list-style-type: none"> ★ Housing installation accuracy to 0.25" and easily field adjusted, (e.g. shorten the housing or add filler sections to accommodate improperly located items. ★ Automatically adds a spare housing section to every order. | Permitted. Everything is measure, cut and fit. | Not Permitted. Housing installation accuracy to 0.0625" and adjustments in field not allowed - cannot shorten the housing nor add in filler sections to accommodate improperly located items. |
| Conductors | <ul style="list-style-type: none"> ★ One continuous CSA and/or UL listed conductor from start to finish. NO JOINTS. ★ Only limit to length is amount manufacturer can spool on cable reel; lack of armor usually means longer runs possible ★ Automatically adds up to 5% more cable to every reel. | One continuous CSA Listed armored conductor from start to finish. No joints. Only limit to length is amount manufacturers can spool on reel. Armor usually limits run length (i.e. shorter than Cabl-Bus). | Insulated copper bars (or aluminum). Multiple joints. Loose fitting boots supplied for wet or exterior installations; the boots do not seal the joint , allowing water entry and possible failure. |



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| Switchgear Terminations | <p>Standard Cable Termination Provision.</p> <ul style="list-style-type: none"> ★ Less costly than bus duct entry provision. ★ Provides all cable termination hardware, including lugs and stress cone terminations. | <p>Standard Cable Termination Provision.</p> <p>Less costly than bus duct entry provision. More costly than Cabl-Bus, more cables to terminate.</p> <p>Contractor must add all cable termination hardware, including lugs and stress cone terminations.</p> | <p>More costly switchgear - must have bus risers to within 8" on top of cell and Duct manufacturer must add cost of flex braid for connecting bus duct to switchgear bus bars.</p> |
| Transformer Terminations | <p>Standard Cable Termination Provision.</p> <ul style="list-style-type: none"> ★ Less costly than bus duct entry provision. Provides all cable termination hardware including lugs and stress cone terminations. ★ Can also provide economical aluminum cable termination boxes, making the transformer less costly to buy and simpler to coordinate with. ★ Ensures there is adequate cable termination space. | <p>Standard Cable Termination Provision.</p> <p>Less costly than bus duct entry provision. More costly than Cabl-Bus, more cables to terminate.</p> <p>Contractor must add all cable termination hardware, including lugs and stress cone terminations.</p> <p>Contractor is generally stuck with using the transformer manufacturers cable termination box and is also stuck if the termination box supplied is too small.</p> | <p>More costly transformer. The transformer termination box must have bus risers to within 8" on top of cell or the Duct manufacturer must supply a steel box and add cost of flex braid for connecting bus duct to transformer bushings.</p> |
| Fire Stops | <p>Nelson Multi-Cabl Transit (MCT)</p> <p>Absolutely water tight. Three (3) hour rated.</p> | <p>Usually contractor installed, may be poured in place or fire retardant packing around cable. Fire rating from one (1) to three (3) hours.</p> | <p>Manufacturer's standard. Fire rating TBA.</p> |



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| Housings | <p>Same ventilated top and bottom covers whether indoors or out, allowing use of free air rated non-armored cables.</p> <ul style="list-style-type: none"> ★ T6063 Aluminum Alloy is used as standard. ★ For special applications, housings may be made from stainless steel or hot dipped galvanized steel. ★ Optional custom fittings are readily available upon request. | <p>Ventilated bottom - OPEN top, requiring use of derated armored cables. Usable indoors and out. Tray available in ladder and vent-rib styles. Tray materials available are aluminum and hot dipped galvanized steel. Some tray manufacturers will offer stainless steel and fiberglass (e.g. MPHusky makes tray from all four materials).</p> | <p>Outdoors - totally enclosed. Requires bus bar derating (I.e. larger bus bars) for exterior portion to make up for lack of cooling. Installer must add anti-condensation treatment to prevent rusting, adding cost. Anti-condensation may take form of breathers & drains or space heaters or both.</p> <p>Indoors - Ventilated enclosure. When everything is indoors, smallest bar size permitted. When part of run is outdoors, then the indoor portion has oversized bars to physically match up with exterior portion, adding additional cost.</p> |
| Material Purchasing | <p>One Purchase Order covers the complete material supply from cable lug to cable lug.</p> | <p>Contractor has to perform detailed take-off and is responsible for purchasing every last nut, bolt, cable lug and stress cone termination kit along with the cable and tray support system.</p> | <p>One Purchase Order covers the bus duct material supply, but the flexible connectors and hardware are NOT usually included by the bus duct manufacturer.</p> |
| Maintenance | <p>None - Owners may want to IR Scan terminations during annual maintenance.</p> | <p>None - owners may want to IR Scan terminations during annual maintenance.</p> | <p>Annually IR Scan terminations and joints. Annually torque the joints. High cost relative to other two methods.</p> |