CIRCULAR NON-SEG BUS FOR GAS TURBINES

"Built Like Iso-Phase; Competitive with Non-Seg"

CROWN ELECTRIC ENGINEERING & MANUFACTURING, L.L.C.

Crown Electric Engineering and Manufacturing LLC designs, fabricates, and installs Iso Phase Bus. Crown also maintains and upgrades IPB for most domestic legacy installations.

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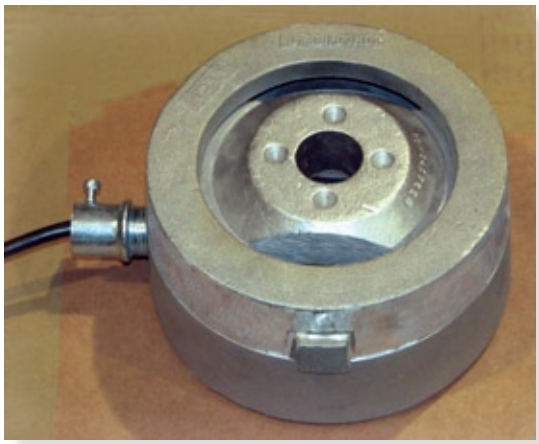
Developed by Westinghouse in the 1970's Circular Non-Segregated Bus Duct is a more rugged, seem-less, maintenance lite, "environmentally tolerant" design that is less costly than traditional non-segregated bus duct when fully evaluated.

Traditional non-segregated bus duct designs are steel or aluminum rectangular housings with aluminum or copper conductor's supported inside. Conductors are often supported by glass polyester insulators or support boards. Conductor insulation is usually shrink tubing, epoxy, or Nyrel sleeving. The housing covers are usually over-lapping bolted panels. Heaters vary, with control wires often running through the inside of the housing.

Problems with traditional non-seg bus designs vs. Crown Electric Solutions:

Problem 1 - Housing enclosure covers can leak. Housing splice joints can leak. Housing degradation due to environmental attack, warping, corrosion, failed gasketing, icing etc… is not uncommon.

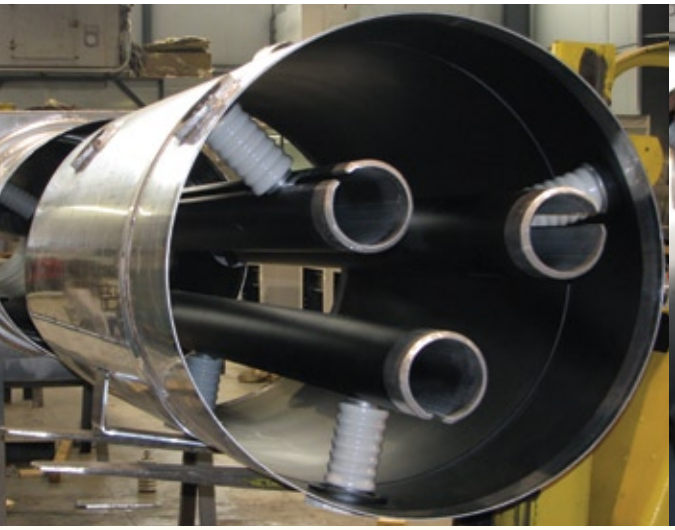
Solution 1 - Circular Non-Seg housing's are fabricated in similar ways to Iso Phase Bus. Circular Non-Seg is produced from flat aluminum sheets which are rolled and completely seem welded. The Insul-mount™ castings which support **high strength porcelain insulators** are then welded into the housings. The completely welded aluminum design eliminates leaks and rust.



Optional built in space heater

Problem 2 - Sleeving and support boards are the generally employed design to provide voltage withstand. Manufacturers attempt to minimize the amount of supports required to lessen expense of material and assembly labor. Should support board materials degrade over time, moisture absorption and tracking at intersecting rub points will ultimately cause in service failures unless caught during routine maintenance.

Solution 2 - No Insulation is required for Circular Non-Seg conductors. The design employs ANSI standard air clearances and maintains full specified BIL level. There is no conductor insulation to deteriorate and fail. There is no insulation material to deteriorate and cause a failure during a fault. Air insulation makes the product inherently more reliable and much easier and less costly to maintain.



Highest quality porcelan insulators

Conductor expansion connections

Problem 3 - Faults develop great mechanical stress. Faults coupled with weakened supports will allow conductors to warp, forcing complete replacement of bus section(s).

Solution 3 - The conductors are symmetrically mounted 120 degrees apart within the housing. This eliminates much of the forces that conductors can experience during a fault. Reduced fault forces allow the insulators to be spaced farther apart. Fewer insulators equates to higher reliability. The Insul-Mount™ tee castings secure the conductors to the porcelain stand off insulators and allow for free expansion and contraction as required. The **porcelain insulators** are easily removable from the exterior of the housing for inspection, cleaning or replacement.

Problem 4 - Conductor splices are bolted together. These are potential hot spots in the bus duct. These bolted joints require regular inspection and maintenance, necessitating multiple access ports (points of leakage) built into the enclosure.

Solution 4 - Conductor splice joints are solidly welded.

Problem 5 - Shipping lengths of traditional bus duct are relatively short.

Solution 5 - The solidly welded ridged construction of Circular Non-Seg provides much greater mechanical strength in each section. Standard shipping lengths of Circular Bus Duct can be 30 feet; with 50 foot sections not uncommon. Entire Circular Non-Seg bus runs can be installed with only one to a few rigging lifts (see cover photo).

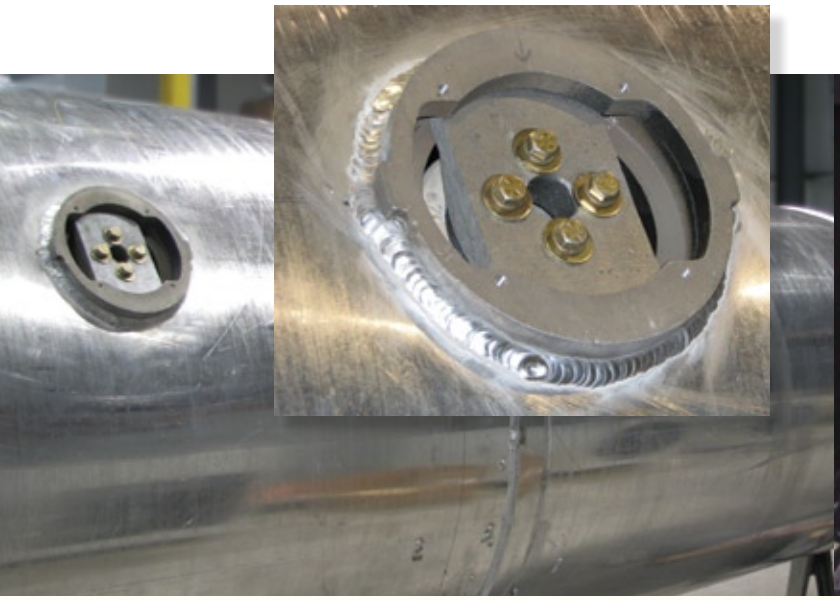
Problem 6 - Traditional bus duct must be supported approximately every 10 ft.

Solution 6 - Circular Bus Duct can be supported every 25 to 30 ft., greatly reducing the civil and mechanical costs associated with structural steel.

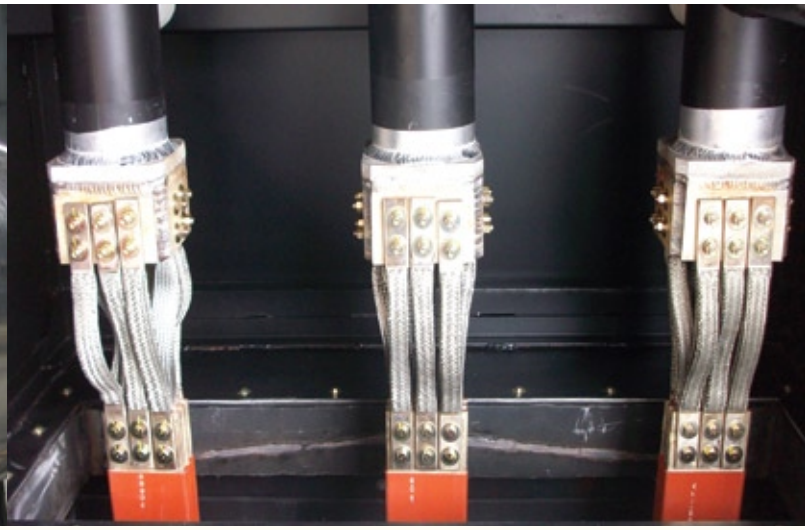
Problem 7 - Proper, vigilant maintenance is very time consuming with its associated costs.

Solution 7 - When comparing similar environmental conditions, maintenance periods for Circular Non-Seg are greatly extended over traditional bus duct . Additionally, the maintenance procedures associated with Circular Non-Seg requires only a fraction of the time inputted for similar lengths of traditional bus duct.

Custom boots



Insulator mounting & maintnance access port



Custom flex braid connectors

"We thank you for the opportunity to serve your company, colleagues, clients and facilities"

Benefits of Circular Non-Seg over Traditional non-seg

- Less expensive when fully evaluated (furnish and installed including structural)
- Less expensive to install
- Less costly structural supports
- Lower life maintenance costs
- Easier to maintain
- More reliable
- Safer
- More environmentally resilient

Benefits of Circular Non-segregated Bus Duct compared to traditional non-seg are over whelming

Cost
Safety
Reliability
Environmental
Reduced Install Time
Reduced Maintenance Needs

Specify Crown Electric Circular Non-Seg

CROWN ELECTRIC * ENGINEERING & MANUFACTURING, L.L.C. *

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