

IMPORTANT

Addendum to “Integrating Electronic Equipment and Power into Rack Enclosures (rev. 4b)” White Paper

P.12 AC Power Wiring Types (cont’d)

Aluminum and Steel Armor Clad for Healthcare Facilities (AC-HCF):

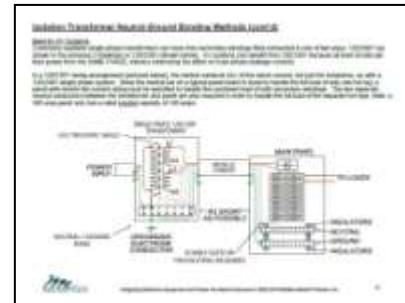
When we first developed this section of the white paper we examined AC-HCF cable and observed that the insulated grounding conductor was located directly between the two current-carrying conductors (Line & Neutral). Such a conductor arrangement would indeed be ideal for an isolated ground branch circuit as the ground conductor would be unaffected by the magnetic fields generated by each of the two current carrying conductors. However, since that time we have examined numerous other AC-HCF cables and have learned that there are no manufacturing standards that address cable geometry, even within the same manufacturer and cable type. Simply stated, it is not possible to know whether the insulated grounding conductor will, or will not be immune to induction from AC magnetic fields generated within that cable. For this reason neither aluminum nor steel armor clad AC-HCF cable can be considered suitable for Isolated Ground AV branch circuits.



P. 21 Isolation Transformer Neutral-Ground Bonding Methods

Best for AV Systems:

‘All same phase’ 120/120 isolation transformer-based power distribution remains a recommended solution for any localized AV system (e.g. all equipment located in close proximity). However, when it comes to a larger, or a more widely distributed AV system, the properties of a 120/240 split single phase arrangement are more beneficial. There are two main reasons for this; the first is simply that when it comes to 120/120 it is not always intuitive to think that the electrical panel board requires a double sized neutral bar. If the panel is not factory-integrated into the isolation transformer there can be confusion in the field, leading to installation errors and, if indeed installed incorrectly, can introduce a dangerously undersized neutral bus into the facility.



The second reason is that each hot leg of a 120/240 split system is 180 degrees out of phase; if the AV equipment is balanced (or at least evenly distributed) across both phases the load currents from each of the phases act to cancel in the neutral conductor, resulting in much lower overall neutral current. In the event of a major electrical wiring error (such as a bootleg ground or an L-N reversal) the impact on the overall system will be less severe. This phase cancellation is also true for leakage currents flowing in the safety (reference) ground. Overall, the phase cancellation benefits within a 120/240 split single phase system outweigh the ‘no cross-phase noise coupling’ benefit provided by a 120/120 system.