

## INSTALLATION REQUIREMENTS CLASS E PERFORMANCE AND CLASS E<sub>A</sub>

### 1 General

- Comply with AS/ACIF S009\* Wiring Rules for safety and ISO/IEC 11801\* for performance.
- Cable shall not be painted. Some overspray of water-based paint is OK if <1m length on cables.
- Cables shall not be higher than the sides of the tray/mesh or pathway.
- The clearance above the sides of the tray/mesh shall be at least 1/2 the width of the tray with 100mm as the minimum clearance.

### 2 Copper Cable

- Max cable bundle size for Cat 6<sub>A</sub> and Cat 6 is 24; for Cat 5 is 32.
- Use the Random Lay principle; 'Random Lay In Bundle And Tray for Cat 6 cable and Cat 6A'.
- Use 6 mm min Velcro™ for all Cat 6 cables at random spacings 200 - 300mm apart on catenaries.
- Follow the natural lay of the cable at all bends and for all temporary and permanent coils.
- Use bend control accessories (eg waterfalls) so that minimum bend radius is not exceeded.
- Min bending radius is 50 mm (100 mm dia) during cable pulling.
- Min bending radius is 25 mm radius (50 mm dia) for hand placement at the TO or in skirting ducts. For tighter bend radius applications, obtain the manufacturer's approval before installation.
- Min bending radius for shielded cable is 65 mm at all times.
- Connected shielded cables to the sockets at both ends. UTP work area cords prevent earth loops.
- Do not exceed the maximum hauling tension of 11kg for Cat 5, Cat 6 and Cat 6<sub>A</sub> cables.
- Min cable lengths are FD-CP 15m, CP-TO 5m, FD-TO is 15m if no CP.
- Red sheathed horizontal fixed copper cabling shall be reserved for fire detection/alarm services. These red sheath cables should be located above communications cables.
- Cables through fire barriers shall be suitably fire-stopped by qualified operators.
- Pair un-twist at any termination shall be <10mm for Cat 6 and <5mm for Cat 6<sub>A</sub>.
- Strip the sheath to within 5 mm or less from module or socket housing for C6 and C6<sub>A</sub> cables.

### 3 Optical Fibre Cable

- Use bend control accessories during pulling so min bend radius as per data sheet is not exceeded.
- Cable direct buried or buried in conduit shall be Loose Tube meeting the 'Water Penetration' test.
- Cable that is direct buried shall be in suitably well-tamped surrounding sand or soft soil.
- Cables in a building shall be Tight Buffered LSZH and UV-resistant where exposed to direct sunlight.
- OF cables in the same conduits as LV power cables should be in sub-ducts.

### 4 Separation For Performance On Copper Cable

- Min performance separation 300 mm to LV cables (if >3m parallel length), transformers and fluors.
- Cabling inside modular furniture partitions and similar enclosures or in service poles shall maintain the 50 mm safety separation or have a solid durable barrier. Wherever possible, maintain a performance separation of up to 300 mm from LV power cables to minimise noise induction.
- Where patch cords are installed behind removable panels in modular furniture or in under-desk pathways, maintain a separation from LV power of 10 mm if possible. The preferred length of patch cords running continuously in parallel with LV power under desks plus in umbilicals is 5 m max.

\* AS/ACIF S009 = Australian Wiring Rules for Communications      ISO/IEC 11801 = AS/NZS 3080

- More detailed information on separation and allowable reduces separation distances are contained in Class E Installation Requirements ADC KRONE Warranty 080423.doc

ADC KRONE specification documents for Class D, E and E<sub>A</sub> systems.

- In umbilical pathways associated with modular office partition systems, the LV power and the telecommunications cables shall use separate compartments. No additional separation or barriers or conduits are required within the umbilical pathway. The end fittings for umbilical pathways shall be such that the minimum bending radius of the communications cables is not exceeded at either end.

## 5 Pathways - Continuous

- Continuous pathways are Tray (flat, slotted), Ducts (in-floor, perimeter, skirting), Conduits, Power Poles or Blades or similar.
- The recommendations in ISO/IEC 18010\* Pathways and Spaces should be followed.
- The min depth of wall/skirting duct is 50mm, for the min bending radius of Cat 6 and Cat 6<sub>A</sub> cables.
- For 3-compartment communications ducts:
  - 50H x 50D mm duct shall contain no more than 24 x Cat 6 or 18 x Cat 6<sub>A</sub> cables.
  - 40H x 50D mm duct shall contain no more than 24 x Cat 6 or 12 x Cat 6<sub>A</sub> cables.
  - 35H x 40D mm duct shall contain no more than 12 x Cat 6 or 6 x Cat 6<sub>A</sub> cables.
- All cabling within false ceilings shall be supported by metal cable tray, trunking, ducting, or catenary wires, fixed by manufacturer approved hangers and methods onto structural building elements.
- All cabling under indoor raised flooring systems should use metal pathways as a preference.
- All conductive pathways should be earthed on the floor where such cable tray is installed. A licensed electrical contractor must make the connection to the electrical distribution board protective earth.
- Before cable is installed and after installation, all conduits, trunking and trays shall be thoroughly cleaned of any material such as cable scraps, dust, dirt, construction debris and moisture.
- Any cable that has been subjected to immersion in fluid shall have the pathway dried and cleaned and the cable shall be completely replaced with new clean dry cable.
- Use 'waterfalls' or other bend control accessory with 50 mm min bend radius, to fully support under any cables that drop 45 degrees or more off a pathway, during and after installation.
- Remove or cover all sharp edges on the cabling pathway in partitions, ducts or trays.
- Cables that exit a pathway shall have adequate 50 mm radius protection over edges, during and after installation.
- Cables installed through sharp-edged metal studs shall have the holes bushed to protect cables, during and after installation.
- Restrict conduit runs to no more than 30m of continuous run inside a building between hauling points and have no more than two (2) x 90-degree bends, in conduits or ducts.
- The pathway system shall otherwise be installed in accordance with the manufacturer's instructions.

\* ISO/IEC 18010 = AS/NZS 3084

## 6 Pathways - Non-continuous

- Non-continuous pathways are Wireways (mesh, ribs), Catenaries, Hooks or Bags. Where non-continuous pathways are used to cable support systems, the following minimum requirements shall be followed.
- The recommendations in ISO/IEC 18010\* Pathways and Spaces should be followed.
- Catenary wires shall be anchored to structural elements of the building and not to any service or support accessory.
- The maximum number of cables on one catenary shall be 2 x bundles of 24 for Cat 6 or Cat 6A.
- The maximum sag of a catenary when fully loaded with cables shall not exceed 150 mm between any two supports or anchor points.
- Mesh trays and cantilever bar systems (eg Whalebone type) for general use shall have metallic or non-metallic crossbars at 100 mm spacing or less.
- Around external mesh corners, the maximum unsupported cable span shall be 150mm. Otherwise use a flat durable sheet in the bottom of the mesh pathway to support the cables.
- Curved bend control accessories that support the cables shall be used to fully support the cables over the bend surface and maintain a minimum bend radius of 50 mm in all situations where the cable or the tray/mesh drops down at an angle of 45 degrees or greater.
- The maximum height of the mass of cables on a pathway shall be 90mm. The height is reduced to 75mm if the cross bar spacing is up to 120mm in special use trays. This ensures there is not too much weight on the bottom cables that rest on the crossbars.
- Supports for non-metallic mesh shall be at 1 m spacing or less. The maximum sag should be less than 200 mm when fully loaded.
- J-Hooks, bags or saddles are not preferred, but if used, they shall be positioned randomly at 800 mm spacing or less.
- The surface of the hook or saddle that supports the cable shall be smooth and at least 34 mm wide with rounded-off edges under the cables.
- The fixings of any cable support system shall be onto the building structure by solid mechanical means, not adhesive means.
- Non-continuous support pathways should be run in straight lines following the building lines, not a diagonal or zig-zag fashion.
- The pathway system shall otherwise be installed in accordance with the manufacturer's instructions.

\* ISO/IEC 18010 = AS/NZS 3084

## **7 ADDITIONAL INFORMATION FOR CLASS E<sub>A</sub> PERFORMANCE.**

### **7.1 General**

- Use UTP or shielded CopperTen Cable (Cat 6<sub>A</sub>) and components.
- Shielded cables shall not be earthed at the TO end, only at the FR/source end.
- Use 3 or 4-port faceplates with staggered UTP socket positions for C6<sub>A</sub> ANEXT separation.
- Termination of CopperTen (Cat 6<sub>A</sub>) cables in the FD shall be on CopperTen Modules accommodating 5 x 4-pair cables. The modules shall be mounted on backmount frames capable of accepting up to 12 modules per frame. The maximum number of 12-way frames in one vertical wall-mount stack shall be 3 for mounting directly onto a wall or a false wall with rear cable access.
- RJ45 termination of CopperTen Cat 6<sub>A</sub> cables in the FD and at the TO shall be on Cat 6<sub>A</sub> capable sockets wired in the T568A colour scheme, with less than 5mm of untwist in the pairs.

### **7.2 Cable**

- Install CopperTen cables using "Random lay in the bundle and tray for Cat 6 cable and Cat 6<sub>A</sub>".
- Do not arrange any cables within the bundles in straight lines, especially at the FD end, to help minimise alien crosstalk between the cables.
- CopperTen Cat 6<sub>A</sub> cables shall be grouped together in bundles not exceeding 24 cables per bundle. Do not mix Cat 6 and Augmented Cat 6 cables in the same bundle for future maintenance reasons.
- CopperTen Cat 6<sub>A</sub> cables should have 25mm separation from Cat 6 cables wherever possible for future maintenance reasons.
- Cat 6A permanent links should be at least 15 m long to minimise low NEXT or RL issues like \*Pass. For <15 m get manufacturer's approval.
- Do not to exceed the maximum hauling tension of 11kg for CopperTen C6 and Cat 6<sub>A</sub> cables.

### **7.3 Pathways - Continuous**

- The preferred depth of surface/skirting ducts is 50mm to accommodate the minimum bending radius of Augmented Cat 6 cables. For 3-compartment communications ducts the same conditions apply to Cat 6<sub>A</sub> cables as apply to Cat 6 cables.
- The maximum number of cables on one catenary shall be 1 x bundle of 24 for Augmented Cat 6 with the cables in a random lay within the bundle.

### **7.4 Pathways – Non-continuous**

- The same requirements apply to Class E and to Class E<sub>A</sub> installations.

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