
INSTALLATION INSTRUCTIONS FOR INSULRAIL CONDUCTOR BAR SYSTEMS

APPLICABLE FOR THE FOLLOWING CONDUCTOR BAR TYPES :

[Standard sizes highlighted in bold]

- ALUMINIUM /STAINLESS STEEL ⇒ 320 Amp rated
- COPPER (For special applications only) ⇒ 500 Amp rated

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1. RECOMMENDED TOOLS

1.1 TOOLS RECOMMENDED FOR INSTALLATION OF INSULRAIL SYSTEM

- Two wire brushes (one for use at ground level, one for use at runway level)
- Linoleum knife
- A tape measure
- A thermometer with probe
- Screwdrivers – Flat Head & Phillips Head
- 4mm Allen Key
- Adjustable Spanner

1.2 ADDITIONAL TOOLS REQUIRED IF FIELD CUTTING CONDUCTOR BARS

- Hacksaw
- 5.5mm diameter drill bit
- A fine flat file

2. HANDLING INSTRUCTIONS

2.1 UNLOADING AND HANDLING OF INSULRAIL COMPONENTS

- 2.1.1 Conductor bars are usually shipped in 4m long cardboard boxes and must be handled with care. Stack boxes horizontally only and support them in at least three places.
- 2.1.2 Do not use the conductor system as a support in any way. The system is not designed to withstand heavy loads, such as ladders.
- 2.1.3 Should it be necessary to clean the conductor system, use only good quality biodegradable detergent/soap and warm water. Do not use solvents, acids or alkalis and avoid contact with oils and grease.
- 2.1.4 Prior to installation, check quantities of parts supplied against the delivery docket and check that no damage has occurred in transit.
- 2.1.5 Please read this installation manual in its entirety prior to commencing installation.

3. INSTALLATION INSTRUCTIONS

3.1 SUPPORT BRACKETS

- 3.1.1 The standard Insul8 3 Phase support bracket consists of a straight length of 25m m x 25m m x 3m m angle iron which is predrilled for standard conductor spacing of 75m m centres. These support brackets are not supplied pre-fitted with hanger clamps. Alternatively, customers can supply their own support brackets to suit their particular application. Fit hanger clamps to support brackets (as described in 3.2.1 below), prior to connecting support brackets to the runway beam.
- 3.1.2 Attach the support brackets to the runway beam (via bolting or welding) at the correct pitch, i.e., 1.5 metre centres for standard mount and 1.2 metre centres for lateral mount and in curves. At all times care should be taken to ensure that the support brackets do not coincide with the conductor bar joints. Ensure a minimum clearance of 150mm between conductor joints, power feeds and expansion assemblies and any mounting bracket.

3.2 HANGER CLAMPS

- 3.2.1 As stated above, the hanger brackets are supplied loose and must be fitted to the support brackets on site. It is easiest to fit the hanger clamps to the support brackets prior to attaching these to the runway beam. Place bolts through mounting hole in brackets and attach flat washer, lock washer and nut, and finger tighten only. (Nuts are only fully tightened after the conductor bars have been installed).

3.3 ANCHOR CLAMPS

- 3.3.1 Anchor clamp quantities and locations are dependent on the length of system and the presence of expansion sections. Note that the anchors are designed to take the place of standard hanger clamps.
- 3.3.2 In systems without expansion sections, fit anchor clamp near the centre of the conductor run. (Note that the maximum system length without expansion section is 150m).
- 3.3.4 In systems with one expansion section, fit one anchor clamp 22.5m either side of the expansion section. (The expansion assembly is usually positioned in the centre of the conductor run).
- 3.3.5 In systems with more than one expansion section, fit one anchor clamp midway between each expansion section, and midway between the last expansion section and the end of the conductor run. (When multiple expansion sections are used the maximum distance between adjacent expansion sections is 45m, and therefore the maximum distance between adjacent anchor points either side of the expansion joints is also 45m).
- 3.3.6 Note that each anchor clamp is supplied complete with all the components required for the installation, including a drawing (# 21833-11) which details the steps involved in installation of the anchor clamp.

- 3.3.7 Take one half of the clamp assembly and fit main bolt into space provided. If metal hanger clamps (Part Number 21600) are used on the system, install the cylindrical spacer piece provided. Do not fit this spacer if plastic hanger clamps (Part Number 22800) are used]. Then attach the half clamp assembly to the support bracket using the spring washer and nut provided (finger tighten only). Set the conductor bar in position, align the other clamp half and then insert cross bolts. Fit star washers and nuts, then fully tighten the cross bolts using an allen key and spanner. Spikes on clamp halves will pierce the bar insulation and bite into the aluminium bars as the cross bolts are tightened. Fully tighten the nut on the main mounting bolt to a maximum torque of 16Nm. Check that the anchor clamp does not rotate but rather remains aligned parallel with the runway.

3.4 MOUNTING CONDUCTOR BAR

- 3.4.1 Push the conductor bar into the hanger clamps until it locks into position. Slight tilting (ie, lateral rotation) of the bar may be necessary to ensure that the bar locks firmly into both lips of the hanger clamp.
- 3.4.2 Once the conductor bars are installed in the hanger clamps, the finger-tight hanger clamp bolts can be fully tightened. Tighten the nut on top of each clamp to a maximum torque of 16 Nm for steel hanger clamps and 10Nm for plastic hanger clamps. Check that the hanger clamps do not rotate during tightening but remain aligned parallel with the runway.
- 3.4.3 Wherever possible, start the installation of the conductor bars from one end and proceed to work towards the opposite end.

3.5 JOINING CONDUCTOR BARS

- 3.5.1 For Aluminium /Stainless Steel conductor bars, the areas to be jointed (on the bars and on the splices) must be prepared prior to joining. The aluminium contact surfaces must be cleaned with a wire brush. Immediately after cleaning apply a joint compound to the joint surfaces and wire brush it in. Avoid touching the surfaces after the compound has been applied. Note: follow the same cleaning and joining procedure when fitting power feeds and expansion sections to Aluminium /Stainless Steel conductor bars].
- 3.5.2 Locate two halves of splice clamp around the conductor end being jointed. Aligning the holes in the splice clamp pieces with the hole in the bar, fit allen key bolt to secure (loosely). Then slide next conductor bar to be jointed into the splice clamp, align holes and fit second allen key bolt. After tightening both allen key bolts, clip the splice cover halves into position and secure with the screws provided.

3.6 POWER FEED ASSEMBLIES

- 3.6.1 These can be installed in place of splice clamps at conductor bar joints, or anywhere within the length of the conductor bar. Note that when fitting the power feed assemblies within a length of conductor bar, a length of 62mm of the insulating cover must be removed from the bar, and 2 x 5.5mm diameter holes must be drilled in the bar (using the power feed as a template).

3.6.2 The same cleaning and jointing procedure as described for splice installation (see Section 3.5.1 above) is required for the contact surfaces on the Powerfeed Assemblies.

3.6.2 Install the supply cables prior to fitting the cover halves. The cover halves are provided with knockout ends to accommodate the supply cables. The powerfeed assemblies are designed to accept up to two flexible 50mm² cables.

3.7 EXPANSION SECTIONS

3.7.1 Expansion Sections are used on systems exceeding 150m long (with normal environmental conditions), on shorter systems which are subject to high ambient temperature conditions, at all structural building expansion joints, where systems are partly indoor and partly outdoor, and where parts of the system are exposed to localised heat.

3.7.2 In systems with one expansion section, the expansion section is usually located at the midpoint of the conductor run. In systems with more than one expansion section, the maximum distance between adjacent expansion sections is 45m. Locations for the expansion sections should be noted prior to the installation and fixing of the conductor support brackets.

3.7.3 Expansion sections are designed to fit between two standard lengths of conductor and are supplied complete with all components necessary for installation. Length of expansion section kit is 500mm.

3.7.4 The same cleaning and jointing procedure as described for splice installation (see Section 3.5.1 above) is required for the contact surfaces on the Expansion Sections.

3.7.2 The air gap within the expansion joint must be adjusted in accordance with the temperature and gap setting chart below, at the time of installation. When the conductor installation has reached the next anchor point, recheck and readjust the air gap if required.

EXPANSION JOINT AIR GAP SETTING CHART

Ambient temperature (C°)	5	16	27	38	50
Air gap setting (mm)	160	148	136	124	110

3.7.3 Expansion sections are designed for a total movement of 50mm, which will accommodate 45m of anchored conductors through a temperature range of 45°C.

3.7.4 Note that installations with expansion sections require two collectors per phase to ensure continuous electrical supply.

3.8 END CAPS

3.8.1 End caps are used to insulate the exposed conductor bare ends at each end of the runway. The caps are designed to simply push on. They may be glued in place using electrical conduit glue, if desired.

3.9 COLLECTORS

3.9.1 The collector mounting arm (25mm square bar) must be installed and adjusted so that its centreline is 89mm from the contact surface. Align the collectors so that they run directly beneath the conductor bars. This will ensure maximum shoe life and permit full articulation of the collector head.

3.10 FIELD CUTTING OF CONDUCTOR

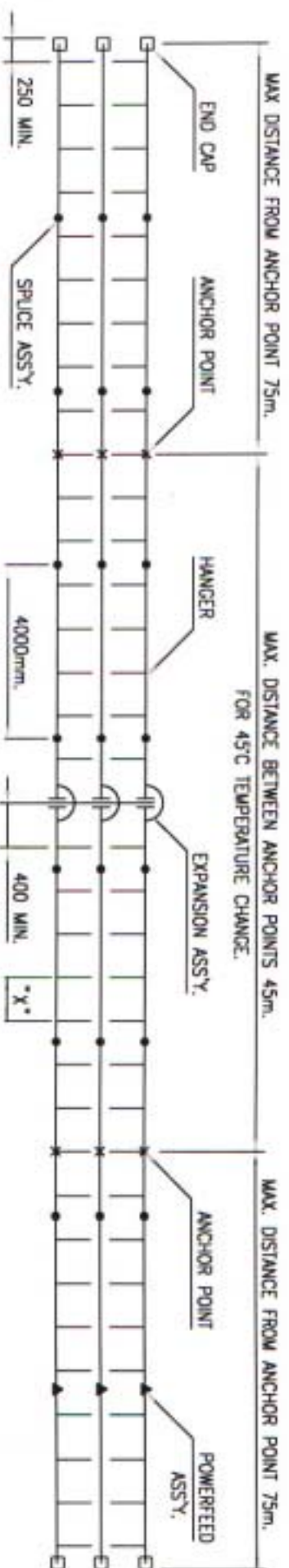
3.10.1 Using a hacksaw, cut completely through the PVC insulation and the metal of the bar. Ensure that the end of the bar is cut square.

3.10.2 Using a hot iron knife, cut back the PVC insulation cover 35mm from the end of the conductor.

3.10.3 Drill a hole 5.5mm diameter 14mm in from each end of the conductor using the splice plates as a template.

3.10.4 With a flat file, bevel stainless steel edge of bar 1.6 to 2mm x 45°. Ensure no burrs or sharp edges are left on the stainless steel and aluminium.

TYPICAL 3 PHASE INSUL-RAIL INSTALLATION



TYPICAL BRACKET SPACING
 X = 1500mm, STANDARD MOUNT
 X = 1200mm, LATERAL MOUNT
 X = 1200mm, CURVES

Standard Conductor Length.	Steel
Expansion Section Length.	4m.
Max. System Length Without Exp.	0.32m.
Max. Distance Between Anchor Points.	150m.
Max. Distance From Anchor Points.	45m.
Distances Based On A 45°C Temperature Range.	75m.

REV.

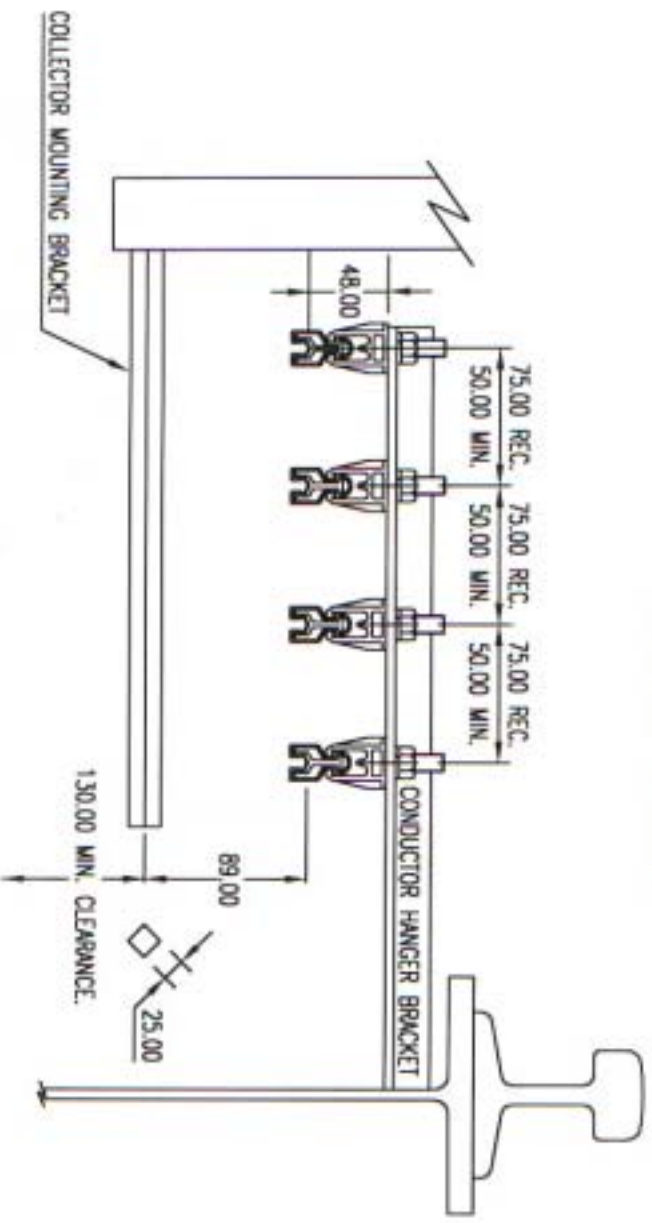


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 A BELLMANUL GROUP

SUBJECT		TYPICAL 3 PHASE INSUL-RAIL INSTALLATION	
CLIENT			
DRAWN	MJ	DATE	22-03-01
DEC.	ANG.	SCALE	NTS.
±0.25	±1"		
REV.		ZD-072	

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STANDARD MOUNTING



REV.



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SUBJECT		TYPICAL INSUL-RAIL CONDUCTOR BAR AND COLLECTOR MOUNTING ARRANGEMENT.	
CLIENT			
DRAWN	MJ	DATE	22-03-01
TOLEANCES	± 0.25	ANG.	± 1°
SCALE		N.T.S.	
ZD-073		REV.	