

ASP General Information

ASP Compliance and Practices



Alert Number: GI22_17

Date: 27th October 2017

Subject: Schneider L-Type Kiosk with Internal Arc Classified (IAC) RM6 Ring Main Isolator

Ausgrid have introduced changes to equipment specification requirements associated with L-Type kiosk substations.

Changes to Ausgrid specifications were necessary in achieving Internal Arc Classification (IAC) compliance and associated functionality in line with the Australian and International Standards.

Due to revised classification requirements the **manufacturers changes are effective immediately.**

Information provided within this document will be updated within the relevant Ausgrid Network Standards in due course.

What will these changes deliver;

- enhanced customer service through improved response time to outages.
- improved levels of safety protection to the general public, ASPs and Ausgrid staff.

What to do next

- Obtain current costing schedules from your equipment manufacturer/supplier.
Note: It is important that current schedules are obtained prior to tendering quotations associated with establishment of L-Type kiosk substations.
- Consider possible impacts these changes may have on your existing tendered projects.
- Ensure all ASP1 staff installing L-Type Schneider kiosks are aware of the relevant changes features and specifications as detailed below.

Background

Internal Arc Classified (IAC) switchgear was introduced in IEC 62271-200 in the late 1990's as a mandatory requirement. Ausgrid have adopted the use of IAC rated switchgear since approximately 2001.

Schneider have developed an IAC compliant 'L' kiosk with A (HV open door) and B (General public closed door) classification in accordance with the requirements of Ausgrid's Technical Specification.

As part of the modifications to gain IAC classification;

- An enclosed arc chamber has been added to the bottom of the RM6 RMI switchgear.
To gain access under the RM6, it will now be necessary to remove the access covers.
Note: Compared to existing Schneider L kiosks, new IAC kiosks will have reduced accessibility.
- An internal bracket is utilised within the Endboxes for cleating and supporting cables.
Note: Cable cleating brackets previously utilised under the RMI have been removed.
- The fibreglass enclosure has been modified to produce a full barrier between the HV switchgear and transformer sections.
- The concrete base has been modified to include a new cut-out between the oil compartment and HV section for housing of transformer cables.
- Concurrent to IAC classification, 1000kVA Schneider kiosks will now utilise RM6 RMI's.

Arc Chamber

An arc chamber has been installed under the RM6 RMI to contain and direct gases in the event of an arcing fault. As part of the IAC classification, the front section of the RM6 has been 'boxed in' with access covers to provide arc protection with the HV doors open. Arc gasses are deflected down and rearward. Non-hazardous volcanic rock (product name Scoria) is utilised as a filter before the gases are exhausted into the concrete base.

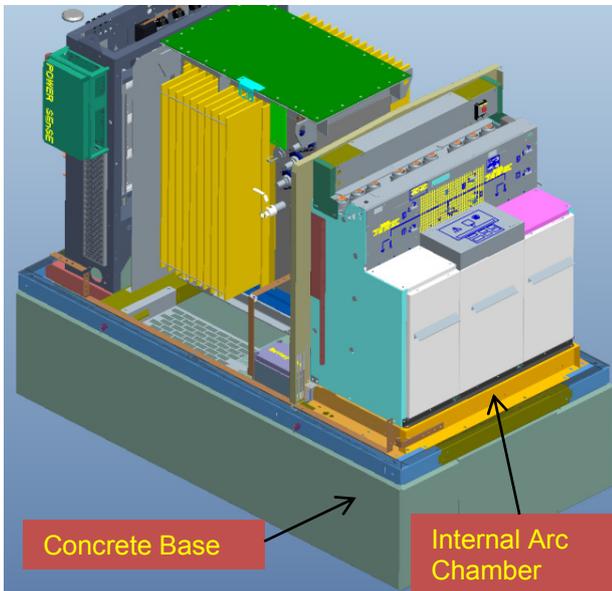


Figure 1 – Arc Chamber (enclosed)

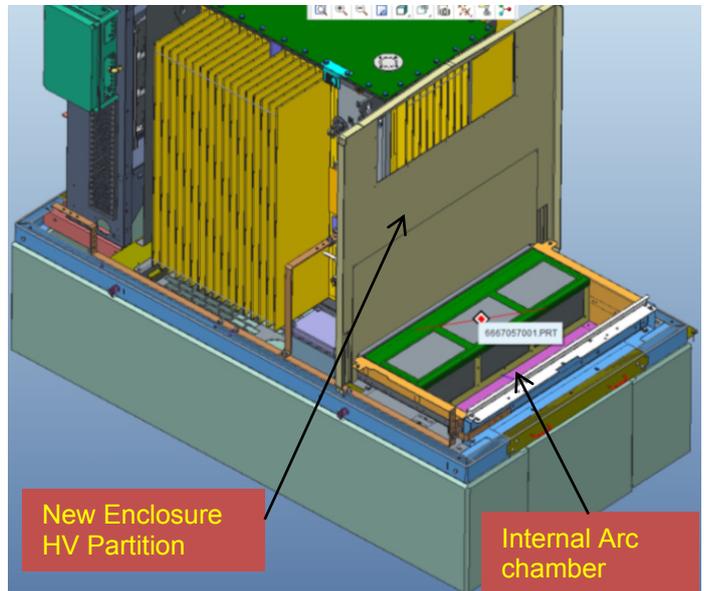


Figure 2 – Arc Chamber (RM6 removed)

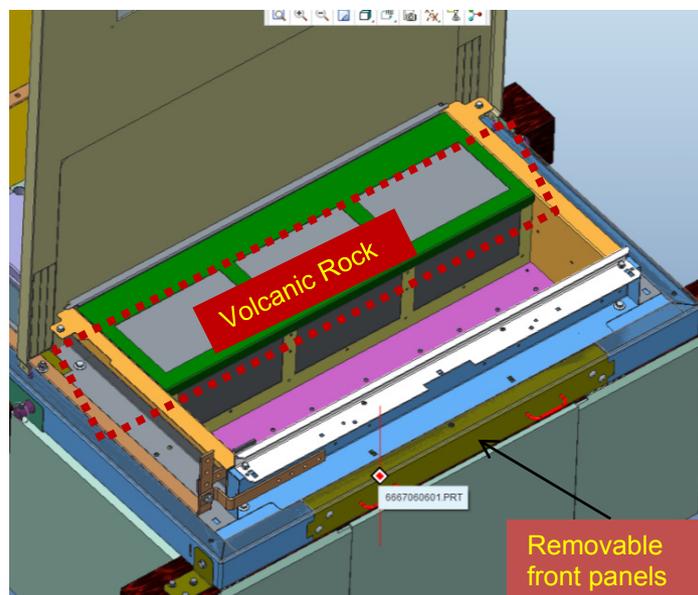


Figure 3 – Arc Chamber (Filters)

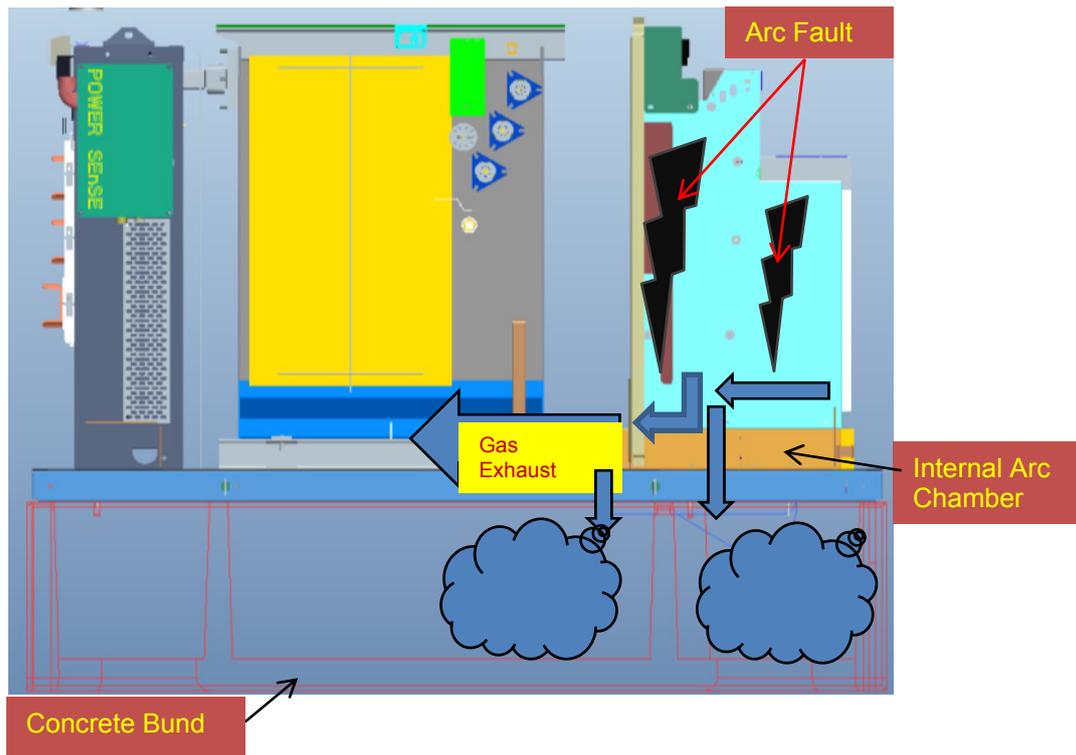


Figure 4 – Arc Chamber (gas flow)

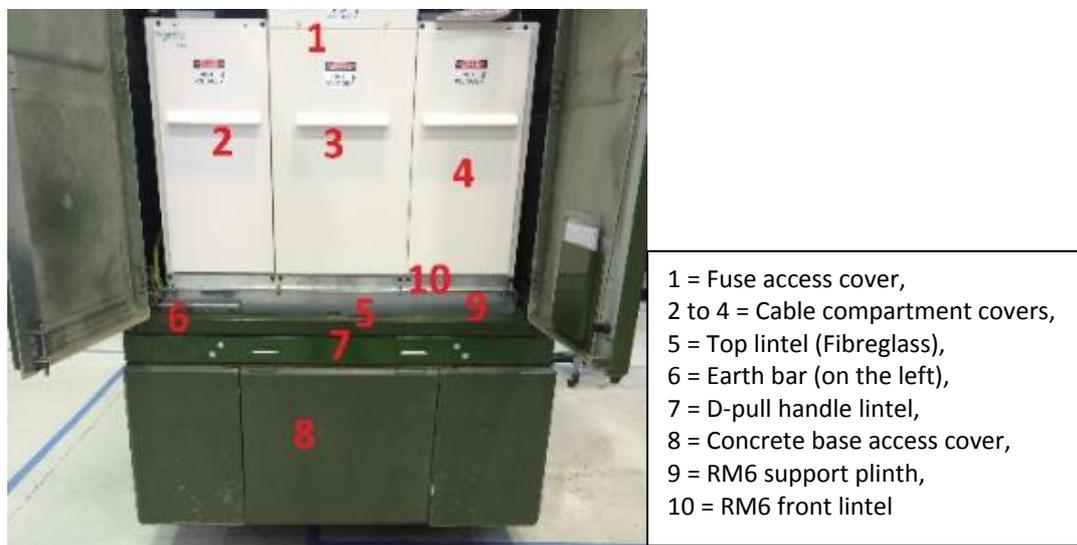


Figure 5 – New IAC KL type kiosk showing access components at the HV doors



Figure 6 – Lower part of the RM6 RMI with endbox covers removed



Figure 7 – Top lintel (Fibreglass), D-pull handle lintel, Concrete base access cover (lintel) and RHS endbox cover removed

HV switchgear endboxes

The internal size of the HV RM6 RMI endboxes has increased with the addition of new arc chamber. Feeder endboxes now have an internal bracket for cleating and supporting cables. The cable cleating bracket under the RMI has been removed.

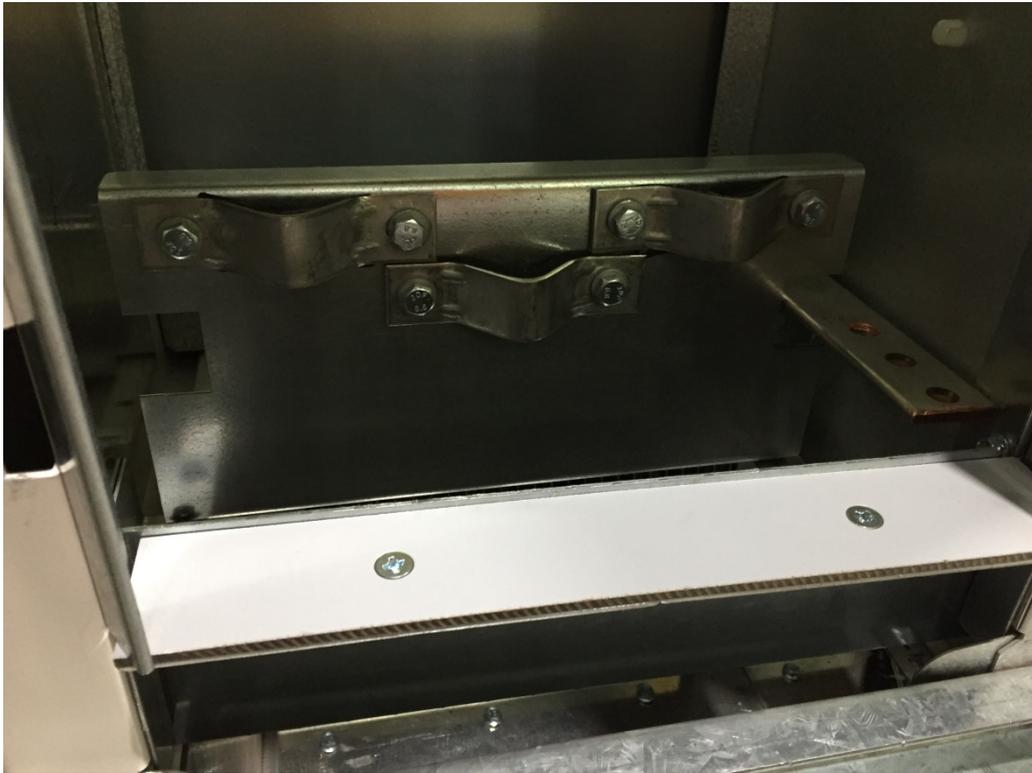


Figure 8 – Cable cleats and bracket inside RHS endbox

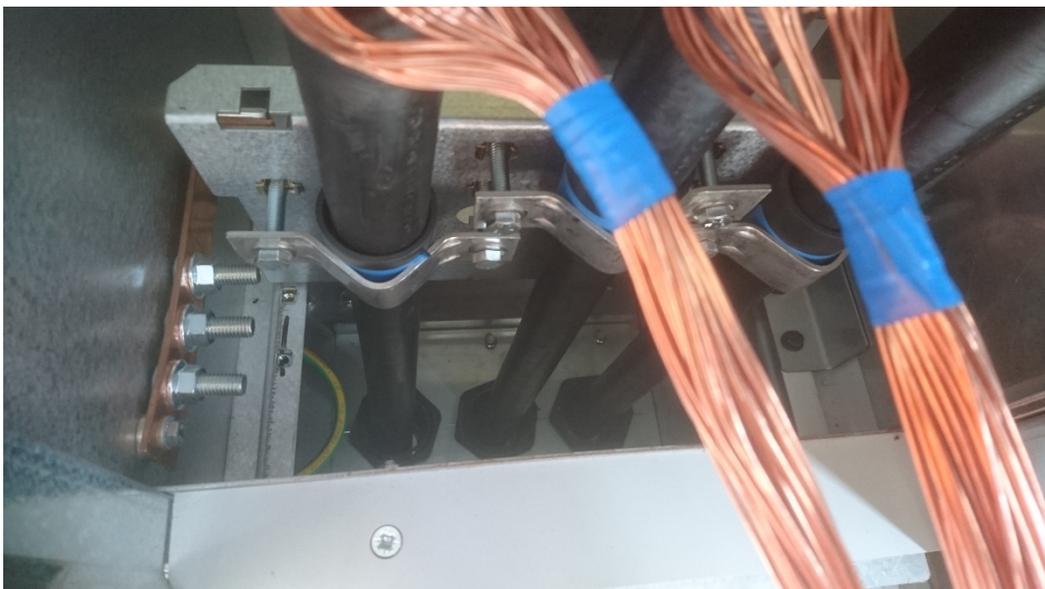


Figure 9 – Cable entry into RHS endbox (early version of cleat bracket and earth bar)



Figure 10 – Cable entry into bottom of RHS endbox



Figure 11 – Transformer cables in tee-off endbox

Layout of kiosk

The layout and footprint of the kiosk remains unchanged except for the addition of the arc chamber under the RMI and associated access covers.

HV cable entry

The existing cable cleat bar under the RMI has been removed due the new arc chamber. Cable entry to the endbox is at approximately the same height as the previous cleat bar.



Figure 12 – Existing cable cleat bar now replaced by internal endbox bracket and supports

Landing of Kiosks

Schneider 'L' kiosks will continue to be delivered in 2 parts (concrete base and kiosk structure). Due to the extended nature of the RMI including the arc chamber, the kiosk will be delivered on larger wooden blocks. During the unloading and landing process, care must be taken to ensure no damage is sustained to the exposed arc chamber and the transformer cables.

The concrete base has been modified to include a new cut-out section between the oil compartment and HV section for the transformer cables.

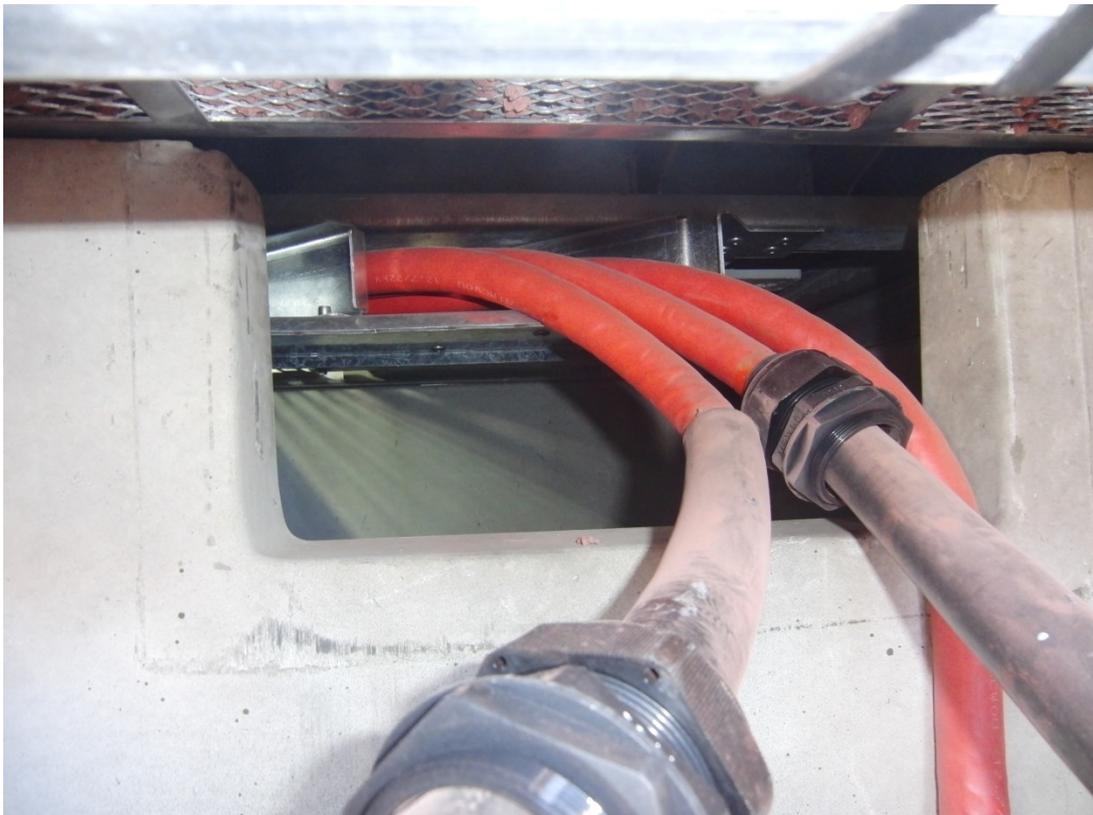


Figure 13 – New cutout section between the transformer oil compartment and the HV section for the transformer cables

Access for cable installation

To achieve IAC classification with the addition of the arc chamber, accessibility has been reduced. This means that gaining access under the RM6 would require removal of the access covers (see attached procedure).

The options for cable installation are as follows:

- Limited access (see Figure 14); or
- Full access (see Figure 15 and 16).



Figure 14 – Cable installation with limited access



Figure 15 – Cable installation with full access



Figure 16 – Cable installation with full access

Cable termination

Refer to the appendix B - Cable termination procedures for RM6 that covers the original non-arc and the arc chamber designs. These changes will be included in NS177 during the next update.

Inspection and test plans

As per existing procedures and standards, it is necessary to ensure that the arc chamber has been fully assembled and all access covers have been properly installed.

Pre-commissioning

Pre-commissioning inspections to confirm arc chamber assembly is required.

Cable testing arrangements

As per normal procedures.

Reference Documents

- ENA Doc 001-2008 National Electricity Network Safety Code
- Electrical Safety Rules
- Electricity Supply (General) Regulation 2014 (NSW)
- Electricity Supply (Safety and Network Management) Regulation 2014
- Work Health and Safety Act 2011 and Regulation 2011
- Schneider Document 'Access RM6 Assembly Ausgrid'

Annexure B –Cable Terminations

Note: Supersedes Clause 10.15 of NS177 as shown below

10.15 Cable termination for RM6 switchgear (HV1-52)

10.15.1 - Non arc chamber RM6 design

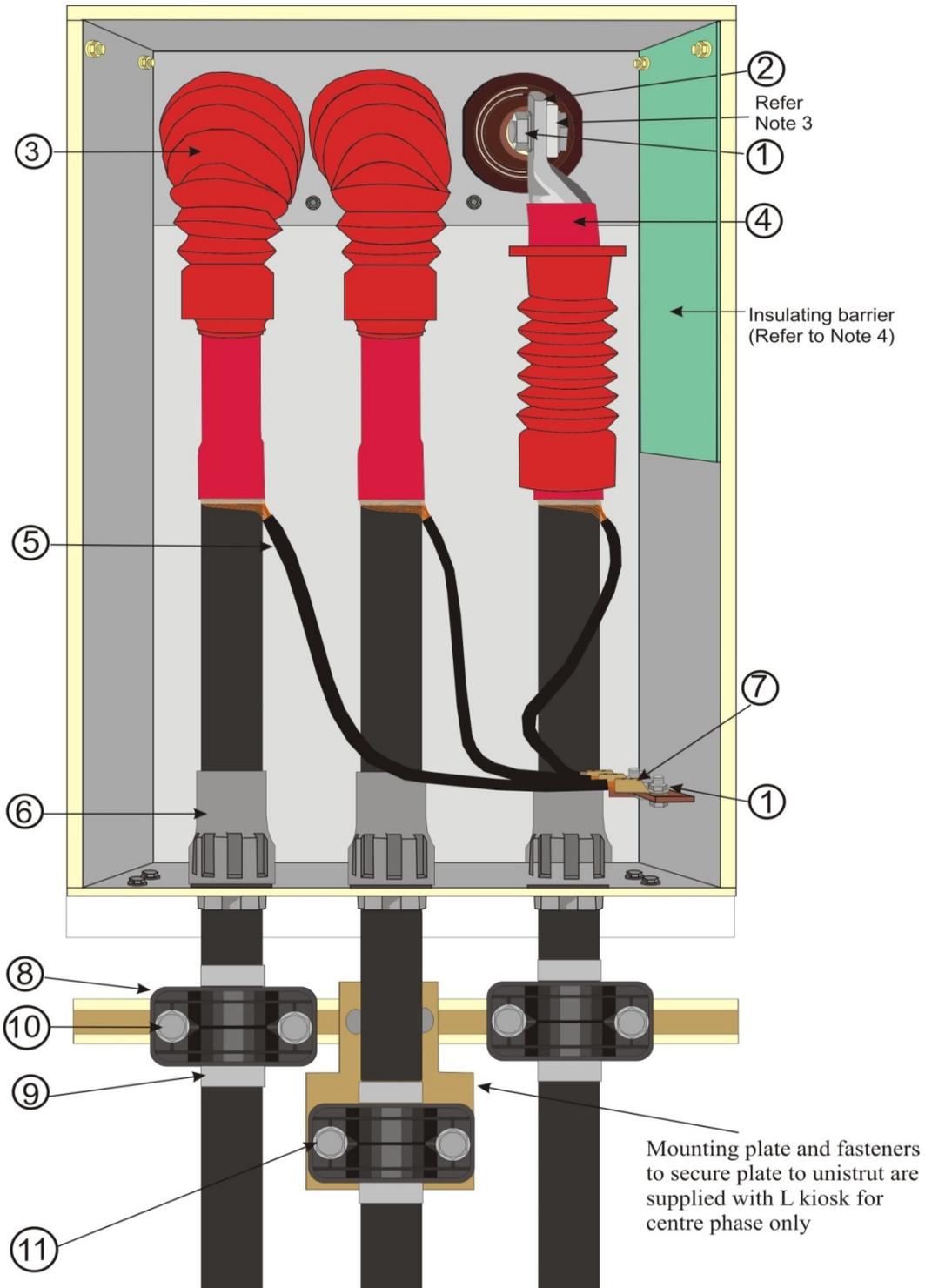


Figure 10-14 – Indoor Termination into Non Arc Chamber RM6 Switchgear
(Left hand side feeder endbox shown)

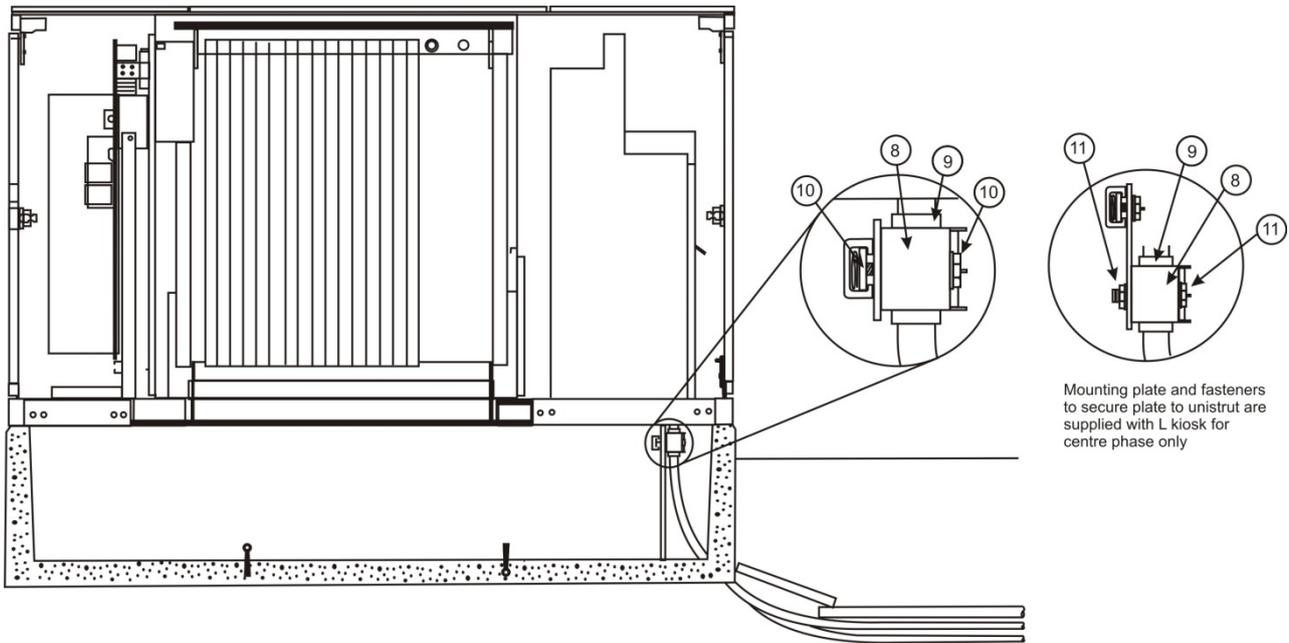


Figure 10-15 – Cable Clamping Details (side view)

Table 13 – Material List for Indoor Termination into Non Arc Chamber RM6 Switchgear

Item	Description	Qty	Stockcode
1	M12 x 30mm stainless steel bolt, M12 stainless steel nut, 2 x M12 stainless steel flat washers, M12 stainless steel spring washer	3	175911
2	Phase core lugs	3	See Clause 10.5 See Note 1.
3	Insulating Sleeve (kit contains three sleeves) for: Feeder Cable Endbox	1	177136
4	Termination kit	1	See Table 2
5	Screen wire re-jacketing tubing For all cables except 185mm ² and 300mm ² single core polymeric cables with 70mm ² Cu wire screen	Cut to length from 40 m roll	177751
	For 185mm ² and 300mm ² single core polymeric cables with 70mm ² Cu wire screen	Cut to length from 10 m roll	90258
6	Cable glands (See Note 6.)	3	177733
7	Screen wire lugs: For all cables except 185mm ² and 300mm ² single core polymeric cables with 70mm ² Cu wire screen	3	177741
	For 185mm ² and 300mm ² single core polymeric cables with 70mm ² Cu wire screen	3	H95851
8	Cable clamp for: 95 to 185mm ² cables with Cu wire screen less than 70mm ²	3	180291
	185mm ² and 300mm ² cables with 70mm ² Cu wire screen	3	180350
9	Nitrile rubber liner	3 Cut to length from 300mm strip	179201
10	Spring-loaded nut M12 x 65mm Stainless steel set screw	4 4	Unistrut Part No. P4010 157099

Item	Description	Qty	Stockcode
	M12 x Stainless steel flat washer	4	49429
Cleating arrangement on mounting plate (centre phase)			
11	M12 x 75mm Stainless steel set screw	2	Blackwoods Part No. 0059 6054
	M12 x Stainless steel spring washer	2	143859
	M12 x Stainless steel nut	2	8987
	M12 x Stainless steel flat washer	4	49429

- Note 1.** The palm width of the lug shall not exceed 36mm.
- Note 2.** Cable glands are to be installed before making the actual termination.
- Note 3.** Prior to terminating the feeder cables into the switch, ensure that the universal screw and lock nut are tight.
- Note 4.** Prior to terminating the cables ensure that the insulating barriers are fixed to the inside wall of each feeder endbox closest to the tee-off cable as shown. If the insulating barriers are missing, please contact Ausgrid.
- Note 5.** Insulating sleeve shall be installed in accordance with the installation instruction supplied in the insulating sleeve kit (For TE Connectivity kits: EPP-0757-8/13).
- Note 6.** For 300mm² single core polymeric cables with 70mm² Cu wire screen the outer composite sheath will need to be removed 120mm below the base of the gland plate to decrease the cable diameter to ensure the gland will fit correctly over the inner composite sheath. A 80mm length of rejacketing tube (stockcode 177730) is then shrunk centrally over the outer composite sheath cut.

10.15.2 - Arc chamber RM6 design

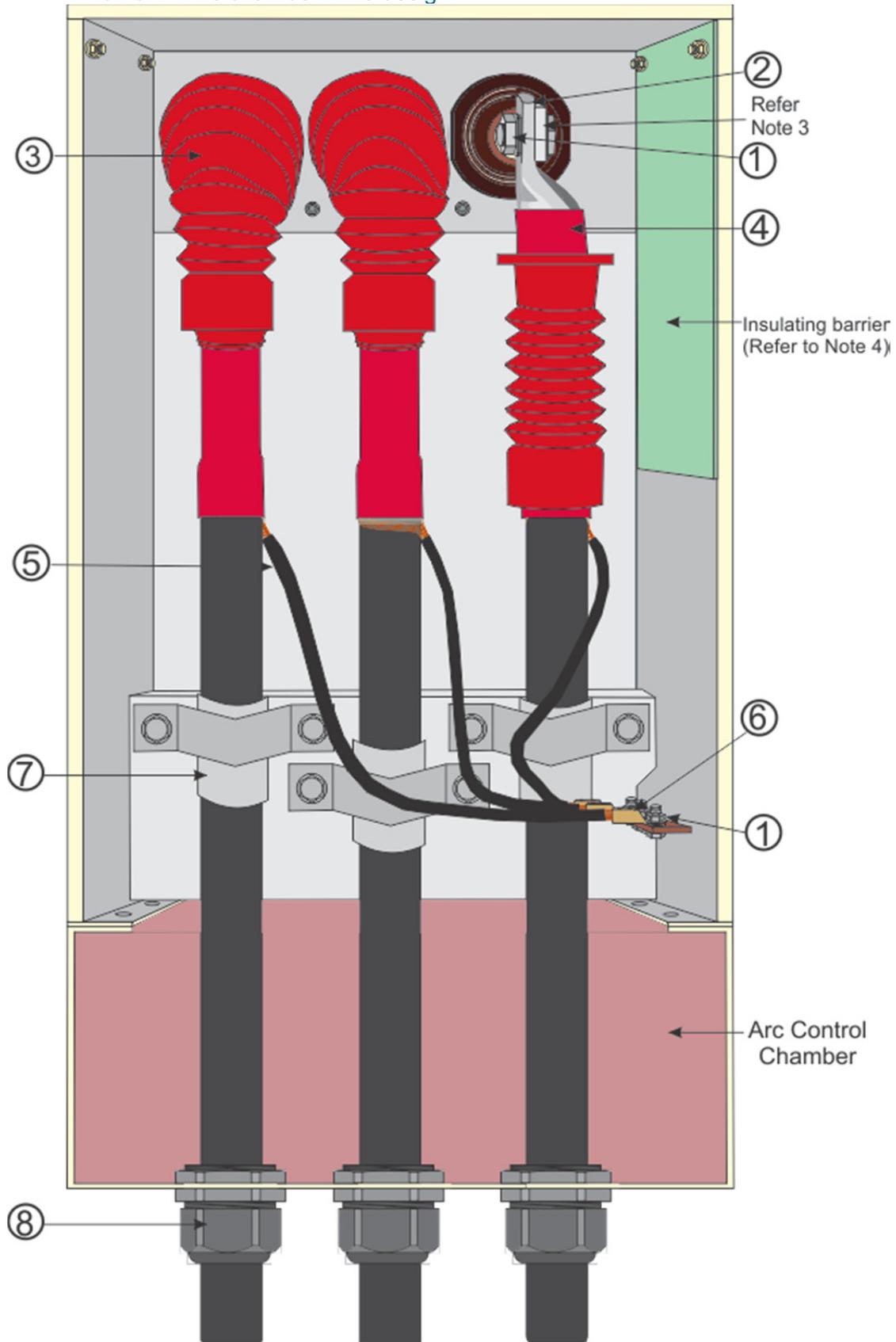


Figure 10-15A – Indoor Termination into Arc Chamber RM6 Switchgear
(Left hand side feeder endbox shown)

Table 13A – Material List for Indoor Termination into Arc Chamber RM6 Switchgear

Item	Description	Qty	Stockcode
1	M12 x 30mm stainless steel bolt, M12 stainless steel nut, 2 x M12 stainless steel flat washers, M12 stainless steel spring washer	3	175911
2	Phase core lugs	3	See Clause 10.5 See Note 1.
3	Insulating Sleeve (kit contains three sleeves) for: Feeder Cable Endbox	1	177136
4	Termination kit	1	See Table 2
5	Screen wire re-jacketing tubing For all cables except 185mm ² and 300mm ² single core polymeric cables with 70mm ² Cu wire screen	Cut to length from 40 m roll	177751
	For 185mm ² and 300mm ² single core polymeric cables with 70mm ² Cu wire screen	Cut to length from 10 m roll	90258
6	Screen wire lugs: For all cables except 185mm ² and 300mm ² single core polymeric cables with 70mm ² Cu wire screen	3	177741
	For 185mm ² and 300mm ² single core polymeric cables with 70mm ² Cu wire screen	3	H95851
7	Nitrile rubber liner	3 Cut to length from 300mm strip	179201
8	Cable glands (See Note 6)	3	179132

Note 1. The palm width of the lug shall not exceed 36mm.

Note 2. Cable glands are to be installed before making the actual termination.

Note 3. Prior to terminating the feeder cables into the switch, ensure that the universal screw and lock nut are tight.

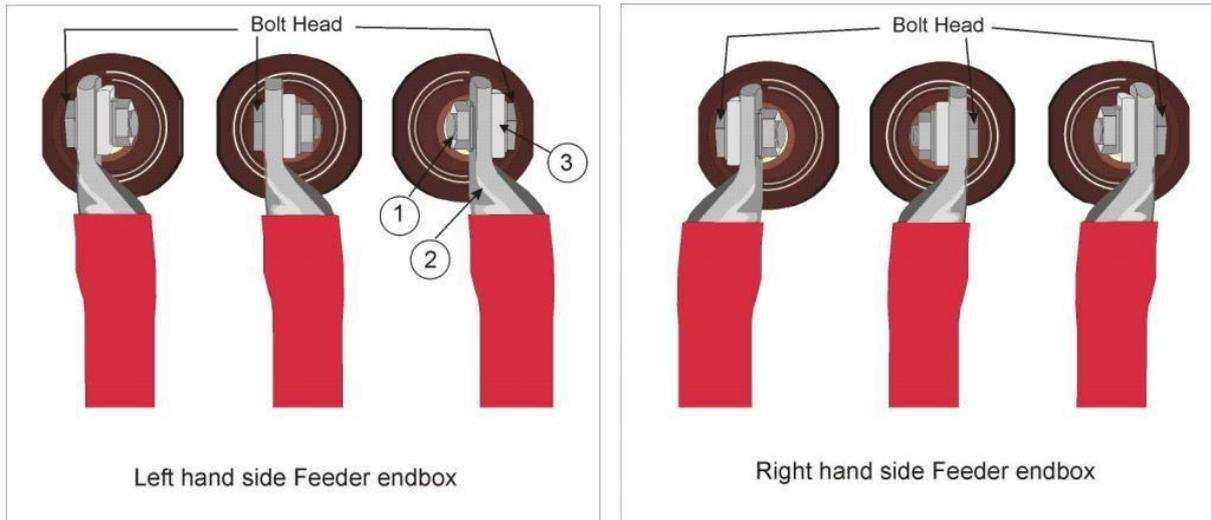
Note 4. Prior to terminating the cables ensure that the insulating barriers are fixed to the inside wall of each feeder endbox closest to the tee-off cable as shown. If the insulating barriers are missing, please contact Ausgrid.

Note 5. Insulating sleeve shall be installed in accordance with the installation instruction supplied in the insulating sleeve kit (For TE Connectivity kits: EPP-0757-8/13).

Note 6. For 95mm² and 185mm² phase cores note the following:

- For 95mm² trifurcated and re-jacketed cable, two layers of WCSM 48/12 (stockcode 90274) tubing will be required in the area of the gland to increase the cable diameter to ensure that the gland will be secured in place.
- For 185mm² single core cables (including 185mm² cables with 70mm² Cu wire screen), a layer of WCSM 48/12 (stockcode 90274) tubing will be required in the area of gland to increase the cable diameter to ensure the gland will secure in place.

10.15.3 - Orientation of Lugs and Bolts in Feeder Endbox



- ① M12x30mm stainless steel bolt, nut, spring washer and flat washer
- ② Phase core lugs
- ③ Universal screw

Note the orientation of the lug palm in relation to the universal screw for each phase.
Note the bolt head orientation for each phase. All bolt heads are not oriented in the same direction.

Figure 10-16 – Orientation of Lugs and Bolts in Feeder Endboxes

**Ausgrid
Project Officers**