

SCHNEIDER ELECTRIC
MERLIN GERIN
PUBLIC DISTRIBUTION PRODUCTS
SCARBOROUGH YO11 3DA ENGLAND

THE **'OPUS'** RANGE

FOR USE BY COMPETENT PERSONNEL

ALL WORK ON THIS EQUIPMENT THAT MAY BE LIVE MUST BE CARRIED OUT IN COMPLETE COMPLIANCE WITH THE ELECTRICITY AT WORK REGULATIONS AND ALL SAFETY PROCEDURES MUST BE OBSERVED. IN PARTICULAR DUTY HOLDERS AND, PERSONS WORKING ON THIS ASSEMBLY OR ADJACENT TO IT, SHOULD NOTE THAT THE DEGREE OF PROTECTION IPXXB PROVIDED BY THIS ASSEMBLY (DOORS OPEN FOR OUTDOOR ASSMBLIES) MAY NOT SAFEGUARD AGAINST THE POSSIBILITY OF SMALL DIAMETER OBJECTS E.G. CABLE STRANDS COMING INTO CONTACT WITH HAZARDOUS LIVE PARTS. IF WORK IS CARRIED OUT WITH ANY PART OF THE EQUIPMENT LIVE A RISK ASSESSMENT SHOULD BE CONDUCTED AND APPROPRIATE PROCEDURES SHOULD BE EMPLOYED.

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OPUS FUSE PILLARS

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1.1 MOUNTING INSTRUCTIONS – TRANSFORMER MOUNTED PILLARS

1.1.1 TO REMOVE THE ROOF Open the pillar doors (2), remove the two screws and washers (3) from inside the pillar.

Lift the front of the roof (1) approximately 25mm and push it backwards until the roof pins (4) clear the brackets.

Lift off the roof.

1.1.2 TO REMOVE THE VENTILATION MESH Extract the screws (6) securing the ventilation mesh (5) and remove. (The number of screws varies with the length of the pillar).

1.1.3 TO PREPARE THE FLANGE Remove the M12 nuts on the transformer flange, which correspond with the 16mm holes in the pillar, flange (8). **NB** The remaining nuts that correspond with the 32mm holes in the pillar flange must be left intact to secure the bushing assembly, which is below the oil level of the transformer.

1.1.4 TO FIT THE GASKET Place the gasket (9) which is supplied loose, onto the transformer flange making sure that it fits flat and clear of the remaining nuts.

1.1.5 TO MOUNT THE PILLAR ON THE TRANSFORMER Using the lifting lugs (11) fitted at each side of the pillar(10) so that it's flange (8) and transformer flange are in line.

Engage the two flanges whilst ensuring that the gasket is properly located and that the copper connections (12) line up with the bushings (14).

Fit the M12 nuts removed under item (1.1.3) but only finger tight.

Ensure that the supports are in line and engage fixing screws but do not tighten. See note 1. Tighten the flange nuts in sequence approximately 1/2 turn at a

time to ensure that the two flanges come together flat and without distortion to the gasket.

Tighten support fixing screws.

1.1.6 TO JOIN THE CONNECTIONS Screws, nuts, washers, packer's (13) are supplied as loose items and stored in bags inside the pillar.

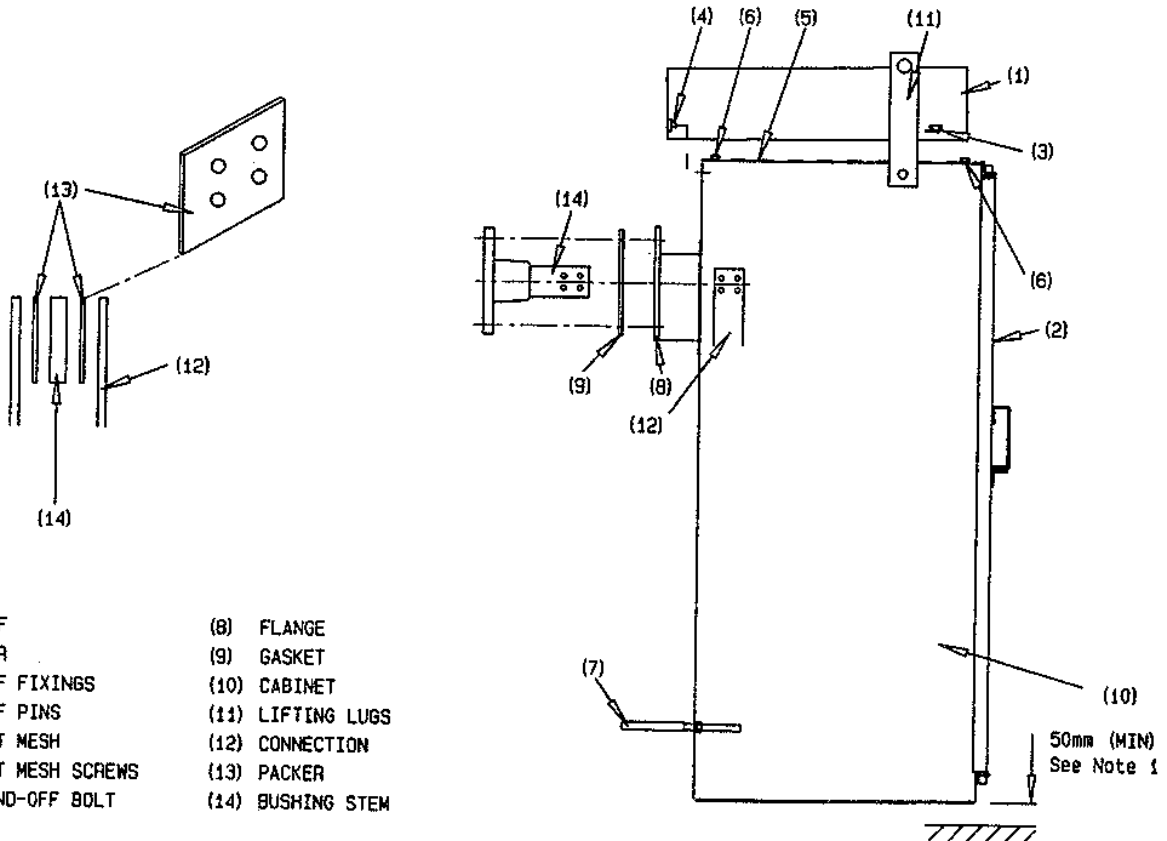
Join the connections (12) to the transformer stems (14) using the screws provided. The packer's (13) are for use with double connections - which are spaced at 20mm, when fitted to 12.5mm bushing stems. Only one packer is required for single lamination connections (12). Packers are not required for 20mm bushing stems.

Ensure all joints are mechanically sound including any adjacent connections/joints, which may have been loosened for adjustment.

1.1.7 TO REFIT THE VENTILATION MESH AND ROOF Reverse procedure 1.1.2 and 1.1.1.

NOTE 1 Standard is by a bracket (7) at the rear of the pillar alternatively it maybe supported at its base. Consult contract documents.

NOTE 2 A gap of 50mm (min) must be maintained between the base of the pillar and ground to allow free air circulation.



- | | |
|----------------------|-------------------|
| (1) ROOF | (8) FLANGE |
| (2) DOOR | (9) GASKET |
| (3) ROOF FIXINGS | (10) CABINET |
| (4) ROOF PINS | (11) LIFTING LUGS |
| (5) VENT MESH | (12) CONNECTION |
| (6) VENT MESH SCREWS | (13) PACKER |
| (7) STAND-OFF BOLT | (14) BUSHING STEM |

1.2 MOUNTING INSTRUCTIONS – FREE STANDING PILLARS

1.2.1 FOUNDATION REQUIREMENTS The foundations should be prepared to suit the length of the pillar (dimension B), this can be obtained by referring to the selection guide in the SAIF catalogue (Publication No. 207SBOA) or by consulting contract documents.

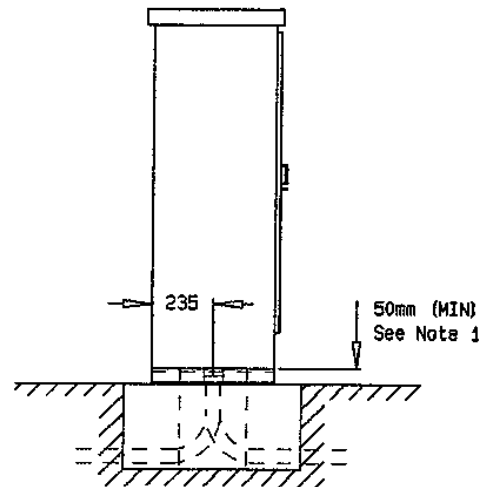
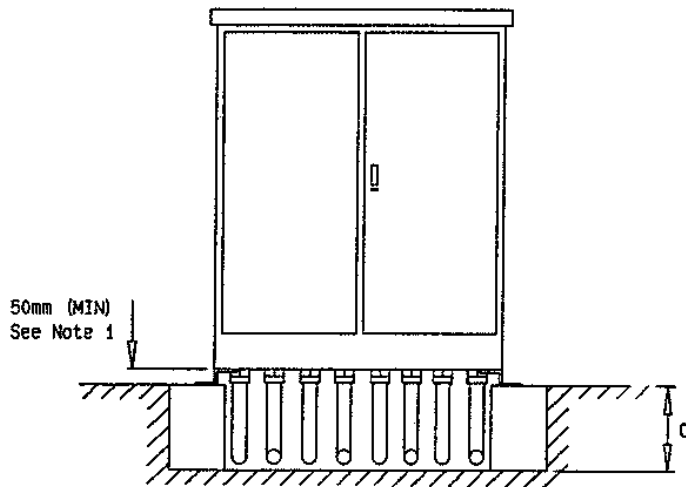
The foundation should be level and any cable trench deep enough to accommodate the cable bending radius.

Suitable bolts/studs will be required to bolt the pillar to the foundations.

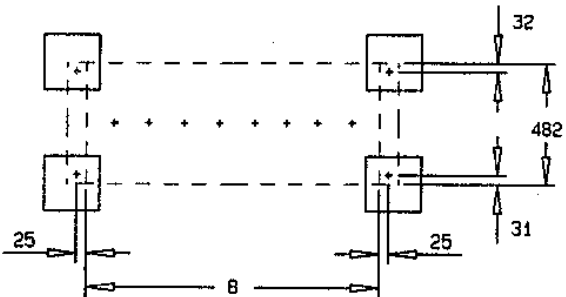
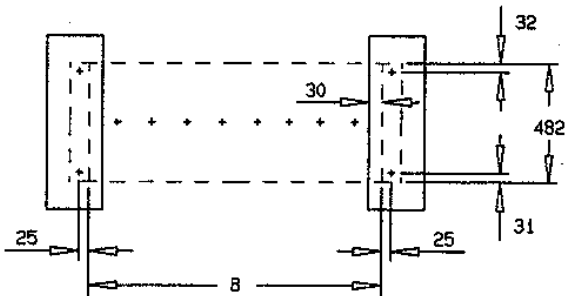
1.2.2 SECURING THE PILLAR TO THE FOUNDATIONS Move the pillar to the foundations and align with the fixing bolts/studs. Temporarily tighten the fixings then check for the correct opening and closing of the pillar door(s), where minor adjustment is required this can be achieved by shimming the appropriate foundation point.

Once the operation of the door(s) is satisfactory ensure the foundation bolts/studs are fully tightened.

NOTE 1 A gap of 50mm (min) must be maintained between the base of the pillar and ground to allow free air circulation.



FOUNDATIONS
(SUPPLIED BY CUSTOMER)



SUGGESTED MOUNTINGS

DIMENSIONS

B - REFER TO SELECTION GUIDE
OR CONTRACT DOCUMENTS

C - TO SUIT CABLE BENDING RADIUS

1.3 COMMISSIONING TESTS

- 1.3.1** The following tests should be carried out after the installation work described in section 1 but before the equipment is energised. Local circumstances may dictate the installation of fused outgoing circuits (including possibly the installation of additional fuseways) at any time during the subsequent life of an assembly.
- 1.3.2** Make a visual check that ventilation screens and grilles are clear. Check all joints made on site are tight and that the earth stud is connected to the substation metalwork earth. Ensure that all appropriate loose tools are available (i.e. operating mechanism, disconnector handle and locking-off devices).
- 1.3.3** Check the mechanical operation of the incoming disconnector/ACB/MCCB and where fitted outgoing disconnector/ACB/MCCB.
- 1.3.4** With all fuse carriers removed and any outgoing disconnectors/ACB/MCCB open, close the incoming disconnector/ACB/MCCB to connect the busbars and connections to the low voltage windings of the (still unenergised) transformer. Remove the neutral earth link between the earth bar and neutral busbar. Test the resistance of the busbars and fittings to earth using a 1,000V meggar. Values in excess of 20 megohm can be expected, but any value above 1 megohm is acceptable. Access to the busbars may be gained by removal of a spare fuse way blanking panel or via the fuseway top contacts.
- 1.3.5** Open the incoming disconnectors/ACB/MCCB and measure the insulation resistance with a 1,000V meggar between the busbars in turn as follows:-
- R to Y+B+N
Y to R+B+N
B to R+Y+N
N to R+Y+B
- Any value above 1 megohm is acceptable.
- 1.3.6** The outgoing sides of the fuseways/ACBs/MCCBs /disconnectors should be insulation tested along with their connected cables or busbars, as and when they are installed, again using a 1,000V meggar.

2.1 FITTING INSTRUCTIONS – OPUS PLUS 400/630A (SIZE 2/3)

2.1.1 PREPARING THE FUSEWAY Remove the three fuse carriers as described in section 2.3.3.

2.1.2 REMOVING THE FRONT ASSEMBLY Turn the three locking discs clockwise $\frac{1}{4}$ turn and lift the front section away from the base assembly.

2.1.3 MOUNTING THE BASE ASSEMBLY Offer the base assembly up to the busbars, line up the studs on the busbars with the holes in the busbar contacts and engage by pushing the fuseway backwards.

Enter the top M8 fixing screw to finger tightness only to hold the fuseway in position.

Enter the bottom M6 fixing screw through the base assembly moulding and into the bottom support bracket.

Secure with the M12 fixings and tighten in turn whilst ensuring that all contact faces properly align with the busbar faces.

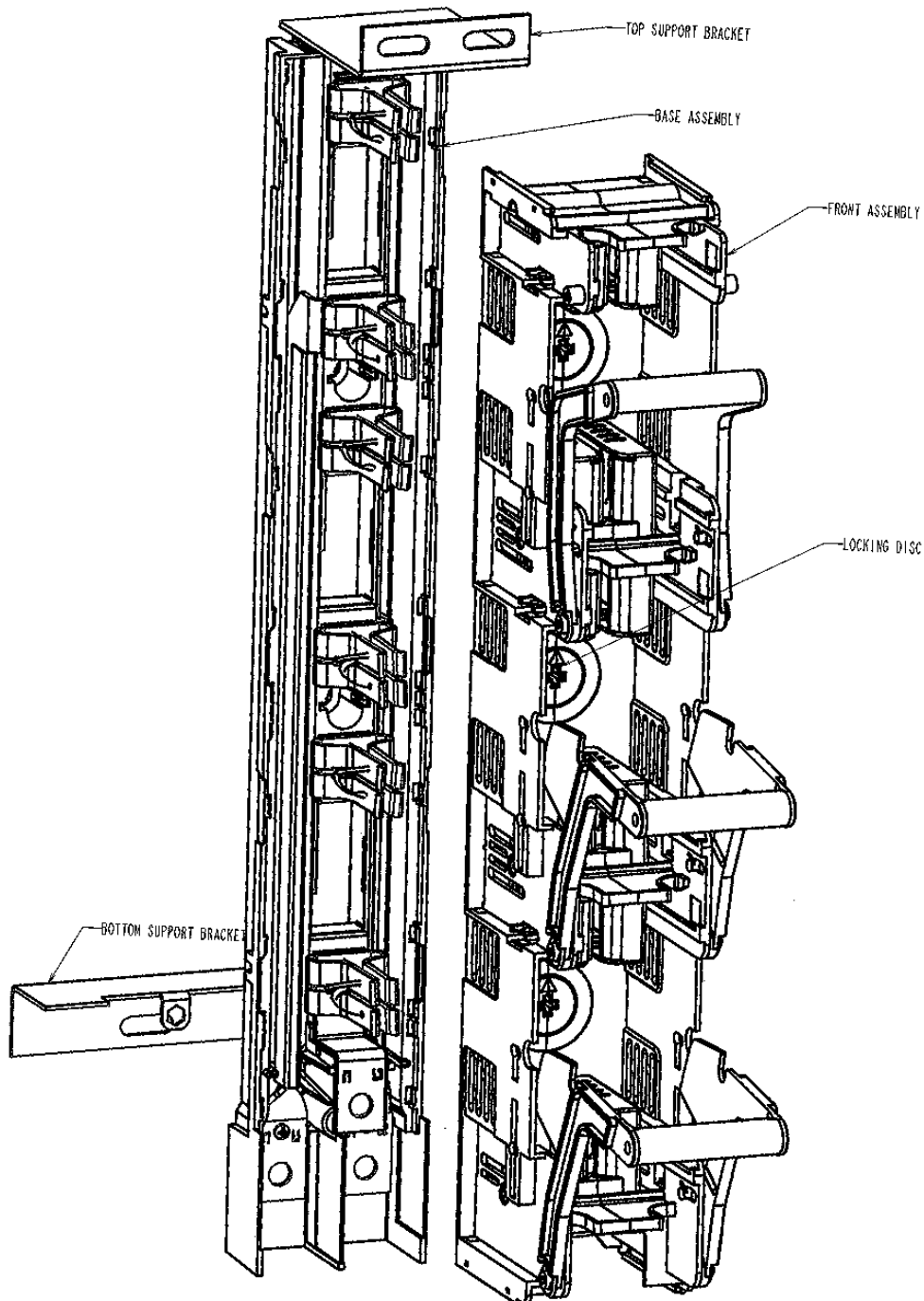
Tighten all the fixing screws and refit the label holder.

2.1.4 REFITTING THE FRONT ASSEMBLY Lift the front section back onto the base assembly and turn the three locking discs anti-clockwise $\frac{1}{4}$ turn.

2.1.5 COMPLETING THE INSTALLATION Replace the three fuse carriers as described in section 2.3.3.

2.1.6 PREPARING THE CABLE GLANDING AREA Cable glanding areas are described in section 3.1.

FUSE LINKS For details of the type of fuse link to be used with this equipment see section 2.2.2.



2.2 FITTING INSTRUCTIONS – FUSE REPLACEMENT/INSTALLATION OPUS PLUS 400/630A (SIZE 2/3)

2.4.1 TO REMOVE A BLOWN FUSE Push the fuse latch forwards until it allows the fuse to be lifted out.

The top fuse tag must rest on the fuse latch on the carrier.

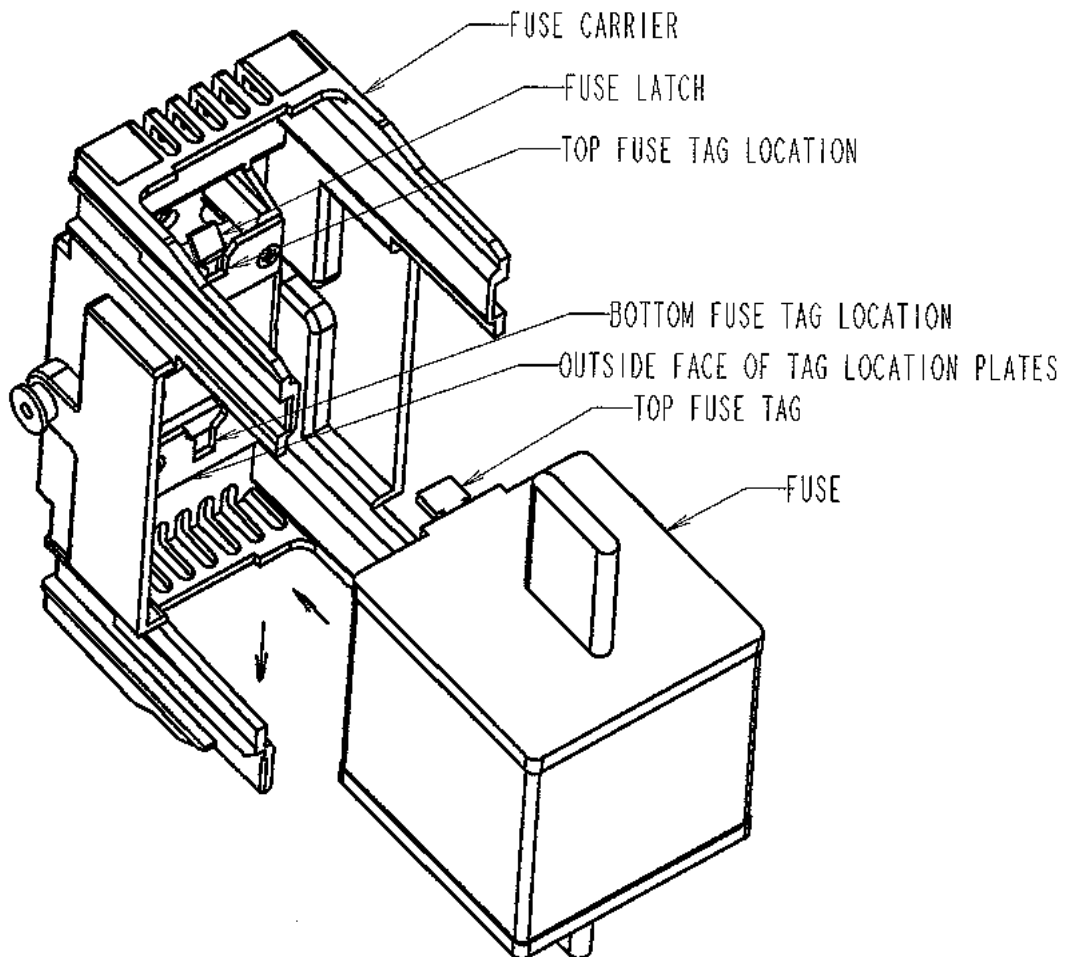
2.4.2 TO FIT A FUSE The 400A OPUS fuse carrier accepts IEC/DIN blade type fuselinks size 2, ratings upto 400A. The 630A OPUS fuse carriers accept IEC/DIN blade type fuselinks size 3, ratings upto 630A.

Push the fuse forward towards the front of the carrier.

When the inside of the fuse touches the outside faces of the top and bottom tag location plates, the fuse can be moved downwards until it clips into place with the latch springing forward holding the fuse in place.

N.B. The rating of the fuse carrier is detailed on the label positioned on the front face of the fuse carrier.

Line up the top and bottom fuse tags with the corresponding fuse tag location plates on the fuse carrier.



2.3 FUSE CARRIERS INTO WAY (OPUS PLUS)

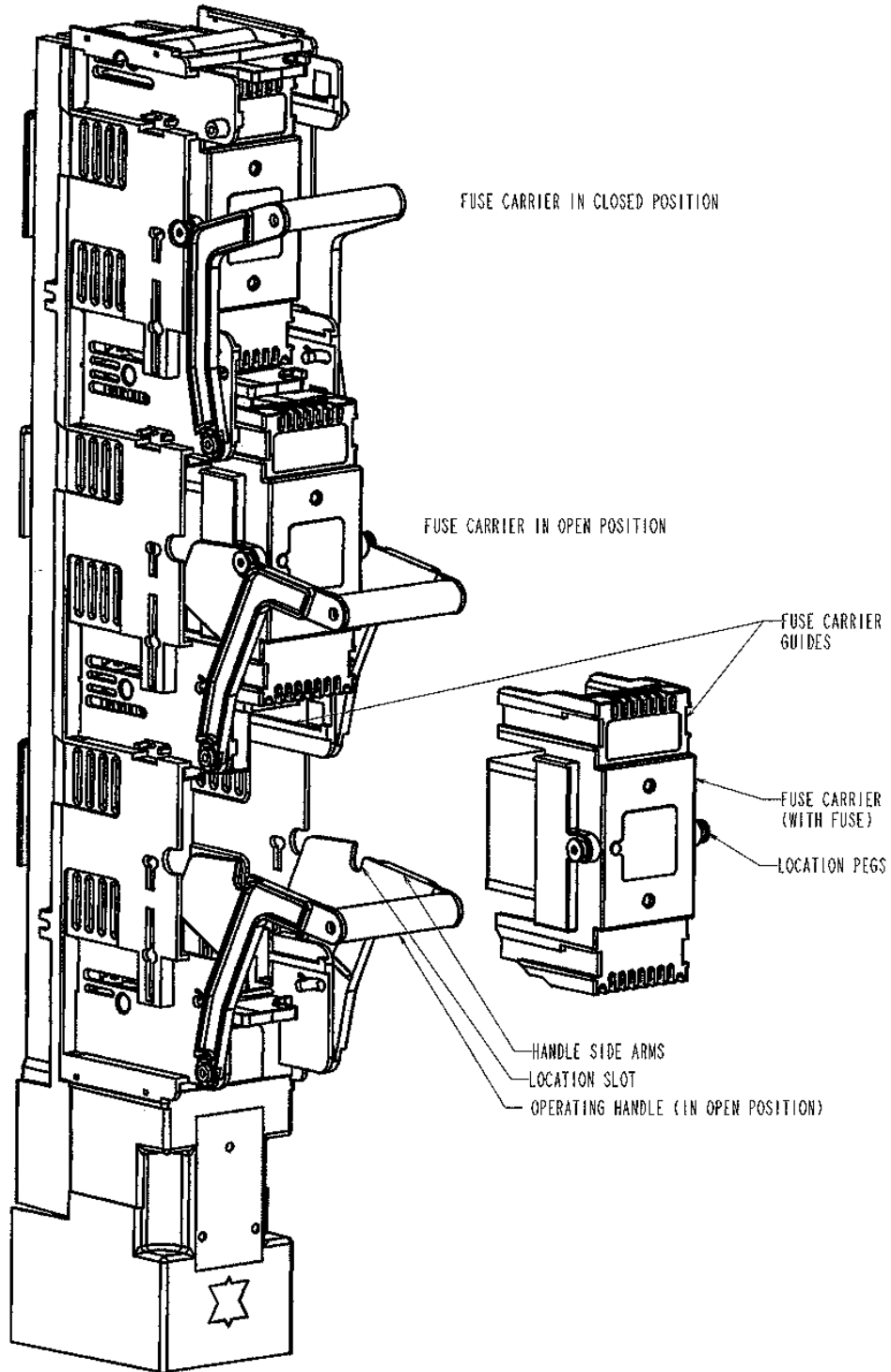
2.3.2 INSTALLING THE FUSE CARRIERS Tilt the fuse carrier to allow it to pass between the operating handle side arms.

Straighten the fuse carrier, locating the carrier guides with the corresponding guides in the fuseway.

Move the carrier forward until the locating pegs locate in the slots in the arms.

The carrier can now be closed by pushing the handle forwards towards the fuseway until it hits the stops.

2.3.3 REMOVING THE FUSE CARRIERS Removing the fuse carriers is the reverse of the above.



2.4 FITTING INSTRUCTIONS – FUSEWAY BLANKING SCREENS

2.4.1 OPUS FUSEWAY BLANKING SCREENS Screens have the same width and fixing points as the 400A/630A OPUS fuseways.

Use one screen for each fuseway position being blanked off.

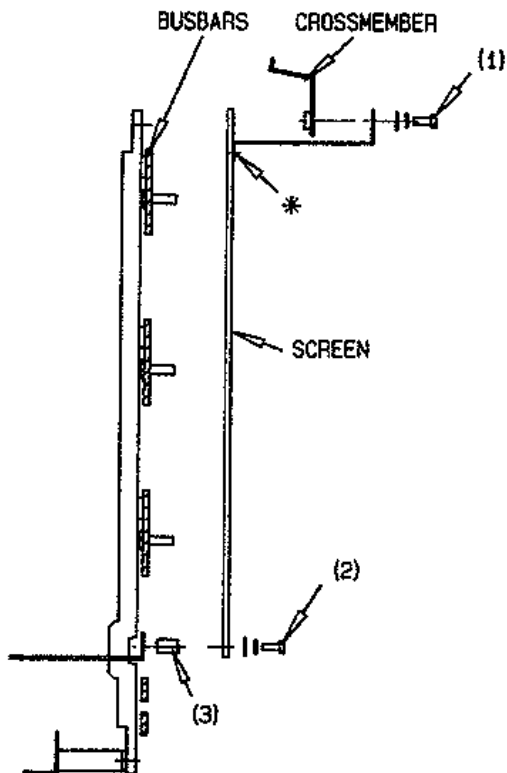
TO FIT THE BLANKING SCREENS Offer up the screen to the area being covered with the insulated top extension behind the top cross member.

Engage the fixing screws (1), together with the flat washer and spring washer, but do not tighten.

Hold the bush (3) between the lower cross member and screen whilst engaging the lower fixing screw (2), together with flat washer and spring washer, tighten both screws.

N.B. Do not release the fixings marked (*)

REMOVAL OF BLANKING SCREENS Removing the blanking screens is the reverse of the above.



- (1) FIXING SCREWS
- (2) LOWER FIXING SCREWS
- (3) BUSH

3.1 GUIDANCE NOTES ON CABLE GLANDING AREAS

3.1.1 REMOVING THE FRONT CROSS MEMBER The front cross member (7) may be removed for ease of access to the gland/bottom plates.

Release the screws (a) at the front of the cross member (and screws (b) at the inside bottom edges on fuse cabinets) then holding the gland support bracket (10), front bottom plate (3). Slide the front cross member forwards. Do not release the row of screws marked (c) or the brackets (8).

3.1.2 GLANDING Two basic types of glanding may be provided according to the type specified in the contract documents.

METHOD A Supplied when all cables within a unit are made off into compression type glands.

An individual gland plate is fitted for each circuit. It rests on the gland plate support bracket (10) and may be removed by releasing the fixing screws marked (d).

METHOD B Supplied when all cables within a unit are made off into split wooden cleats.

An individual split wooden cleat is fitted for each circuit and is attached to the rear half of the split bottom plate (2).

METHOD C Supplied when cables within a unit have a mixture of compression type glands and split wooden cleats or a combination of single core and multi-core cabled circuits.

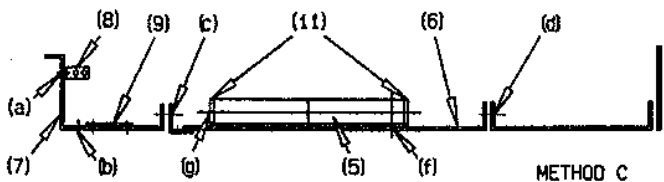
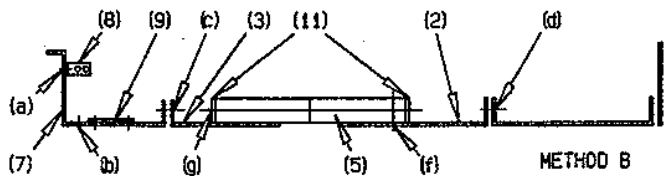
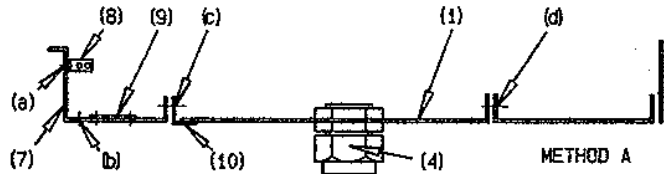
Plates for compression type glands are exactly as described for method A.

Split wooden cleats are the same as those supplied for method B but in this instance are supported by a modified gland plate as for method A but which has an oversize hole to allow the cable to pass clearly through the split wooden cleat.

3.1.3 GLAND PLATES Unless supplied as pre-drilled, drill the gland plate to suit the size of the gland being used in line with the centre of the cable core terminations.

3.1.4 SPLIT WOODEN CLEATS Unless supplied pre-drilled and split, drill a hole to suit the cable being fitted at the centre of the cleat. Cut the cleat along its centre line parallel to the clamp plate (11). Always split after drilling.

3.1.5 OTHER ARRANGEMENTS In some instances, e.g. cable incomers or oversized feeder cables etc, some variations of the above may be made but the principals outlined would not alter.



- (1) GLAND PLATE
- (2) REAR BOTTOM PLATE
- (3) FRONT BOTTOM PLATE
- (4) CABLE GLAND
- (5) CABLE CLEAT
- (6) CLEAT SUPPORT PLATE
- (7) FRONT CROSS MEMBER
- (8) CROSS MEMBER BRACKET
- (9) VENTILATION GRID
- (10) GLAND PLATE SUPPORT BRACKET
- (11) CABLE CLEAT CLAMP PLATES

3.2 CABLING INSTRUCTIONS – OPUS FUSEWAYS

3.2.1 TO PREPARE THE GLANDING AREA Cable glanding areas are described in section 3.1.

3.2.2 TO REMOVE THE TERMINAL SCREEN

CAUTION Cable connections will be connected to the busbars when the fuse carriers are in the 'ON' position. Slide the cable screen away from the fuseway until clear of the guides.

3.2.3 TO TERMINATE THE CABLES Gland the cables and terminate the cores in accordance with the instructions for the type of cable and termination method selected and the following.

3.2.4 PHASE CORES

Attach the cable sockets, using the screws, spring washers and flat washer as shown to the correct phase connection and tighten.

3.2.5 NEUTRAL CORE Make off the neutral core directly onto the neutral busbar termination screw below the fuseway position.

3.2.6 TO REPLACE THE CABLE SCREEN Locate the cable screen into the guides and slide back into position.

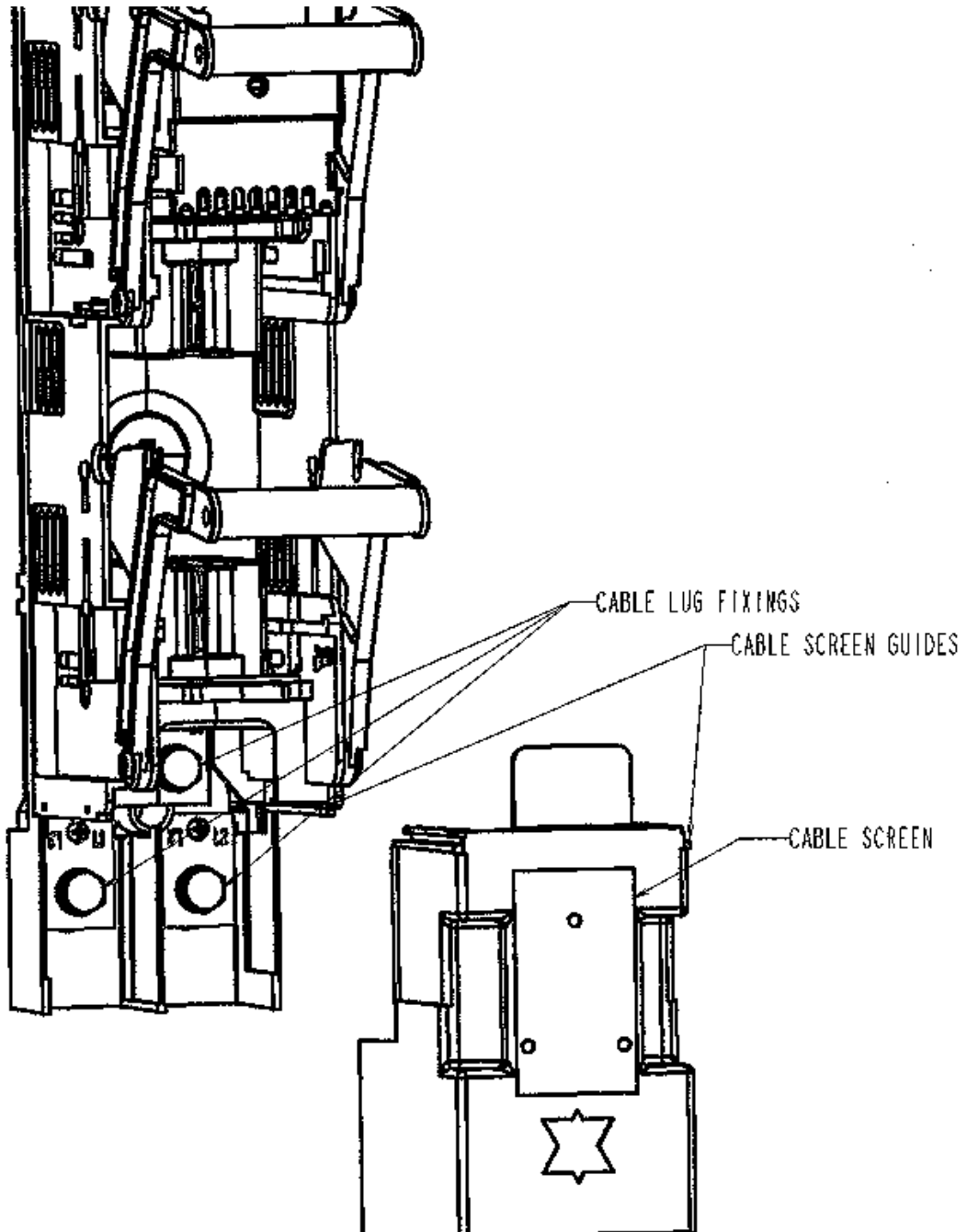
3.2.7 TO RESTORE THE CABLE GLANDING AREA Refit any parts removed under item 3.2.1 above.

FUSE LINKS

The 400A OPUS fuse carrier accepts IEC/DIN blade type fuselinks size 2, ratings upto 400A.

The 630A OPUS fuse carriers accept IEC/DIN blade type fuselinks size 3, ratings upto 630A.

For details on installing fuse links see section 2.2.



3.3 CABLING INSTRUCTIONS - SHROUDED DISCONNECTORS

3.3.1 TO PREPARE THE CABLE GLANDING AREA Cable glanding areas are described in section 3.1.

3.3.2 TO REMOVE THE SCREENS

CAUTION Busbars will be exposed when screens are removed and cable contacts will be connected to busbars when the disconnectors are in the 'closed' position.

Release the fixings (1) screws at the top and nuts at the bottom, lift off both screens.

3.3.3 TO REMOVE THE WOODEN BARRIERS Release the screen securing nuts (14) and slide off the barriers.

3.3.4 TO TERMINATE THE CABLES Refer to 3.3.5 below before proceeding.

Gland the cables and terminate the cores in accordance with instructions for the type of cable and termination method selected and the following. **N.B.** Fit the tapered PVC bushes (13) over the blue phase cable cores, narrow end first, and fit before making off the cable end sockets. The narrow end of the PVC bushes (13) must be trimmed to maintain a tight fit over the cable core.

3.3.5 TO REFIT THE WOODEN BARRIERS Fit the rear section of the left hand split wooden barrier (7).

Make off the blue phase and neutral cores. Before securing to the connections (5) and (6) as shown, slide the PVC bush(s) (13) over the blue phase cable core to

a position where the wide portion fits the recess in the wooden barrier (7) about half way along its length.

N.B. The neutral core does not pass through the wooden barrier (7).

Fit the rear section of the right hand split wooden barriers (7).

Fit the middle section of the left-hand split wooden barrier (7).

Make off the yellow cores and secure to the connections (4).

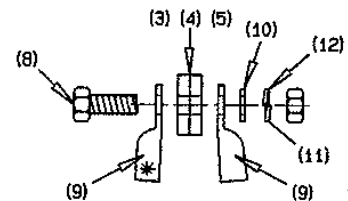
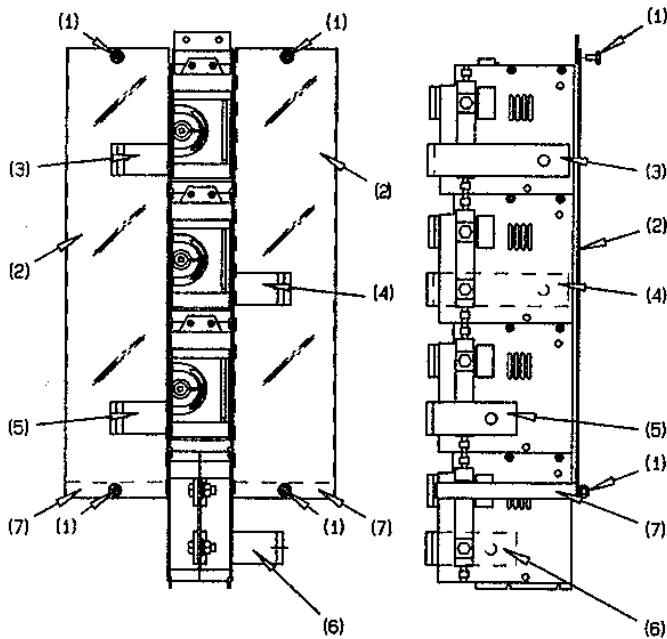
Make off the red cores and secure to the connections (3).

Fit the front section of both split wooden barriers and secure.

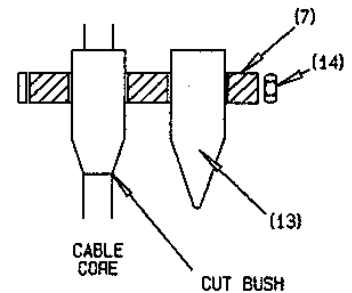
Ensure all joints are mechanically sound.

3.3.6 TO REFIT THE SCREENS Reverse procedure in 3.3.2 above.

3.3.7 TO RESTORE THE CABLE GLANDING AREA Refit any parts removed under item 3.3.1 above.



ASSEMBLY OF TWO CORE CONNECTION (SINGLE BOLT OR FOUR BOLT.) * OMITTED ON SINGLE CORE CONNECTIONS



- | | |
|-----------------------------|--------------------------|
| (1) SCREEN FIXINGS | (8) BOLT |
| (2) SCREEN | (9) CABLE SOCKET |
| (3) RED PHASE CONNECTION | (10) FLAT WASHER |
| (4) YELLOW PHASE CONNECTION | (11) NUT |
| (5) BLUE PHASE CONNECTION | (12) SPRING WASHER |
| (6) NEUTRAL CONNECTION | (13) PVC BUSH |
| (7) SPLIT WOODEN SCREENS | (14) SCREEN SECURING NUT |

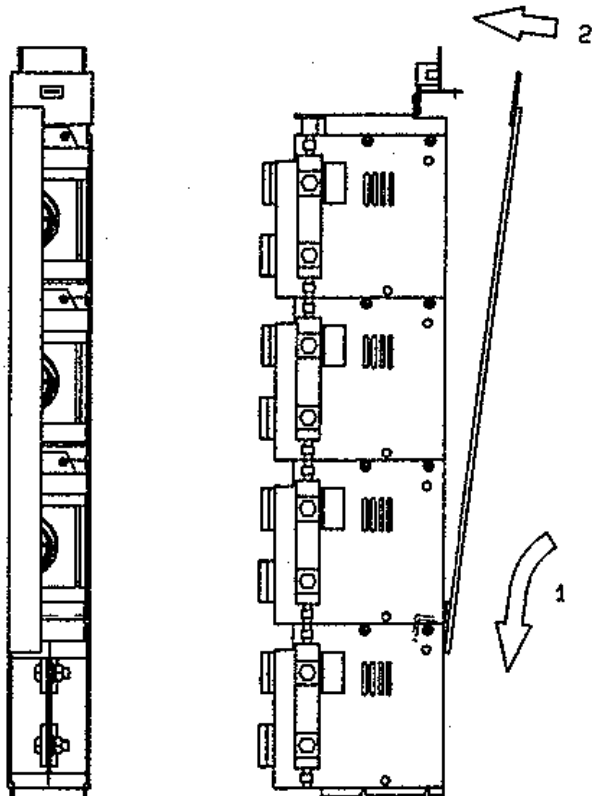
4 USE OF AUXILIARY DEVICES

4.1 DISCONNECTOR PADLOCK DEVICE (PDV)

For padlocking vertically mounted disconnectors. Can be fitted with the disconnector open or closed.

DESCRIPTION The device consists of a long narrow insulated bar with a steel bracket top and bottom.

- 4.1.1 Take the device with the flat bracket upper most and the insulated bar to the left.
- 4.1.2 Hook the lower bracket over the two nuts protruding from the insides of the disconnector moulding just above the neutral section.
- 4.1.3 Hinge the device towards the disconnector, the locking bar will pass through the slot in the top bracket.
- 4.1.4 Insert a padlock through the locking bar with the device trapped behind, the device now prevents insertion of the operating pole.



DISCONNECTOR
PADLOCK
DEVICE
(PDV)

