Notes.
1. All Measurements in Millimetres.
2. For details of the trench under transformers, refer to B427-A4
3. Only install low voltage board when required. Refer to section 1.4.
4. Ventilation duct openings to be 100 from floor. Extraction fans to be installed on opposite side of room when ventilating louvers are not used.
5. This door may not be required if an equipment access door is suitably located and can also serve as a personnel access door.
6. Ceiling height for top entry equipment = 3750 mm, for bottom entry equipment = 3200 mm.
7. Field Test to test controller ie Temperature settings & commission.
8. LV isolators (Dwg. 7940-A4) shall be used with dry type transformers in CBD & high rise buildings (Refer section 1.4).

Indoor Substation
Typical Layout - Minimum Clearances
Safelink (CCF1) RMU, 1 x Dry Type
Transformer & LV Switchboard / LV Isolator
9000-A4
Notes:
1. For details of the trench under transformers, refer to 8427-A4.
2. (a) In some circumstances LV board may not be required.
   (b) LV board may be located against wall when Energex intake cable DO NOT enter sub through the same wall.
   Refer section 1.4 for detail & confirm with Energex planning officer.
3. Ventilation duct openings to be 100 from floor. Extraction fans to be installed on opposite side of room
   when ventilating louvers are not used.
4. This door may not be required if an equipment access door
   is suitably located and can also serve as a personnel access door.
5. Ceiling height for top entry equipment - 3750 mm, for bottom entry equipment - 3200 mm.
6. Field Test to test controller & temperature settings & commission.
7. LV isolators (Dwg. 7940-A4) shall be used with dry type transformers in CBD & high rise buildings (Refer section 1.4).

Indoor Substation
Typical Layout - Minimum Clearances
Safeplus HV Switchgear, 1 x Dry Type
Transformer & LV Switchboard /
LV Isolator

energex
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A

App. C. Lee
O.D. R. Keen
D.R. A. McCook

9305 - A4
Notes.
1. For details of the trench under transformers, refer to B427-A4
2. (a) In some circumstances LV board may not be required.
   (b) LV board may be located against wall when Energex intake cable DO NOT enter sub through the same wall.
   Refer section 1.4 for detail & confirm with Energex planning officer.
3. Ventilation duct openings to be 100 from floor. Extraction fans to be installed on opposite side of room
   when ventilating louvers are not used.
4. This door may not be required if an equipment access door for bottom entry equipment – 3200 mm.
   is suitably located and can also serve as a personnel access door.
5. Ceiling height for top entry equipment – 3750 mm,
6. Field test to test controller & Temperature settings & commission.
7. LV isolators (Dwg 7940-A4) shall be used with Dry Type Transformers in CBD & high rise buildings.
   (Refer to section 1.4).

UNCONTROLLED COPY
NOTES
1. Earth Pockets with Chase
   Refer Drawing 7917-A4 for details.
2. All connections to Earth Strap are separate
KEY
1. A.C. BOARD 18 POLE (SUPPLIED BY BUILDER)
2. BATTERY CHARGER (BY ENERGEX)
3. D.C. BOARD (BY ENERGEX)
4. ALARM INTERFACE PANEL
5. FIBRE PATCH PANEL 1.
6. FIBRE PATCH PANEL 2.
7. SACS PANEL (WHERE REQUIRED)
8. METERING UNIT OR HOUSE TRANSFORMER
9. RING MAIN UNIT
10. PILOT ISOLATION CUBICLE 1.
11. PILOT ISOLATION CUBICLE 2.
12. TELEPHONE LINE ISOLATION UNIT
13. REVENUE METERING PANEL
14. ALTERNATE DOOR POSITIONS

NOTE:
- FOR CLARITY, SOME EQUIPMENT IS NOT SHOWN IN ELEVATIONS.
- HIDDEN DETAIL AND CABLE LADDER NOT SHOWN.
KEY
1. NEMA 12A CABLE LADDER - 450mm
2. ALTERNATIVE PERSONAL DOOR POSITIONS

NOTE:
- EQUIPMENT IS NOT SHOWN.
- EARTHING AS SHOWN. FOR CONSTRUCTION DIRECTLY ON NATURAL GROUND, FOR SUSPENDED FLOOR SLAB CONSTRUCTION REFER TO THE "COMMERCIAL AND INDUSTRIAL CONSTRUCTION MANUAL" SECTION 5 "EARTHING" AND DRAWING REF: 7501-A4 FOR DETAIL.
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**Typical Hinges for Double and Personnel Gates**

1. Clearance between gates will be 30x10 and min 5mm and max 30mm on hinge side.
2. Double Gates require Drop bolt fitted to one of the gates.
3. All Steel components to be Hot Dipped Galvanised.
4. Length of Cuphead Bolt & Locking Pin will vary with material size of the frame or post used.
5. Hexagon Nuts to be locked together or if a single Hexagon Nut is used then it must be spot welded to the Cup Head Bolt & Lock Pin.
6. For Fence and Gate details refer to Dwg 7872-64

**Latch for Double & Personnel Gates**

**General Construction Information**
Manufacturing details for hinges & catches for use on double & single gates

7870-A4

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**A4 Original Issue**

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APP/D: G.Bartlett

CRD: A.Tsakan

DRN: D.Langley
**DROP BOLT DETAILS**

**UNISTRUT** P1000C1x200

**15Ø Hole**

**12Ø Galv. MS Rod**

**Sheeting See Fencing Drgs.**

**Galvanised Chain minimum size 6.5mm Dia.**

**30±10**

**ALTERNATE LOCKING DETAILS**

**NOTES**

1. Clearance between gates and posts will be 30±10.
2. To minimise gate noise, a Door Stop shall be fitted to the top of the gates.

---

**General Construction Information**

Details for drop bolt and alternate locking arrangements for double & single gates

7871-A4

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**A ORIGINAL ISSUE**

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APP'D: G.Bartlett
CRD: A.Tikun
DRN: D.Langley
NOTES:

1. The enclosure walls shall be constructed of non-combustible materials such as 200mm concrete blocks or 0.7 corrugated/ribbed (Colour Bond) steel or similar attached to a Galvanised Structural steel framework by suitable cladding fasteners. Maximum length of side fence to be 10 metres.

2. Minimum size for Framework
   (a) Gate & Corner Post 50x50x2.5 Galtube or 40NBx3.2 Galvanised Pipe.
   (b) Intermediate Post and Rail 40x40x2.5 Galtube or 32NBx3.2 Galvanised Pipe.
   (c) Gate/Door Frame 25x25x2.5 Galtube or 20NBx2.5 Galvanised Pipe.

3. Galvanised caps to be fitted to top ends of the hollow sections.

4. All welds shall be covered with 2 coats of Zinc rich paint and covered with DURAGAL silver paint (Tubemakers Structural Products Division).

5. For safety no sharp edges shall be exposed especially adjacent to locking devices.

6. Install 200LxP1000Q Galvanised UNISTRUT insert for gate drop bolts.

7. Clearance between gate will be 30x10mm except on hinge side, the clearance will min 5mm and max 30mm.

8. For locking and hinge details refer to Dwg 7870-A4

9. Drop Bolt to be made non removeable by suitable tack weld.

10. Cladding to be fixed to all Rails & Posts in accordance to Manufacturer’s Specifications.
NO TRENCH COVER SHALL EXCEED 20kg. MASS.

STEEL FLOOR PLATE COVERS  (FOR OUTDOOR USE.)
Covers shall be manufactured from 6mm thickness steel checker plate and shall be 'HOT DIP' galvanised after hand holes have been cut by the owner/builder of the premises. Thickness of the plate does not include the height of the raised sections. Any cable holes will be cut as required and the cut surfaces given two (2) coats of Zinc-rich paint by ENERGEX. The covers shall be true and flat not twisted, so as not to be a potential hazard.

The length of a cover must not exceed the dimensions shown so that the mass does not exceed the maximum suitable for a one man lift.

PLAN

PREPARATION OF FLOOR PLATE

When STEEL TRENCH COVERS are being made it is recommended that all four (4) sides to be cut at the same time and by the same method as shown, to evenly distribute the stress caused by cutting. This minimizes distortion of the steel plate when 'Hot Dip' galvanised.
MATERIALS & NOTES:
1. Aluminium Doors with Louvres (500mm from top of the door).
2. Heavy Duty Aluminium hinges. Minimum of 4 hinges required, welded (not riveted) to frame.
3. One door must be fitted with a keyed operating lock. The other door must be fitted with a shooting bolt top & bottom. The shooting bolt handle is to be a maximum of 2000 from the floor.
4. Vermin proof mesh to be fitted to exterior and interior of each door over louvred area.
5. 'D' handles to be fitted to the interior and exterior of both doors.
6. When doors open within a building, 2 hr fire rated doors must be fitted.
NOTES

1. ALUMINUM Sheeting [18 or 20 gauge] to be fitted to inside of door. Sheeting to be fitted to door as directed by ENERGEX for Ventilation control.
2. Galvanised Bird mesh 12x12x1.25 to be fitted to inside of doors and held in place with 25wx3mm Aluminum extrusion. Panels to be fitted with mesh as directed by ENERGEX Design.
NO TRENCH COVER SHALL EXCEED 20kg MASS.

1. Covers shall be manufactured from 21mm thick CCA treated structural plywood of stress grade ‘F14’ which has an approximate density of 12.5kg / sq. m. Covers should be sized as shown below for convenience of handling. Hand holes to be drilled and cut by the owner/builder of the premises. Covers shall be given two (2) coats of non-slip epoxy paint or other equally acceptable treatment on all sides. Cable holes will be cut by ENERGEX as required and cut edges painted. Cutting, drilling and disposing of CCA plywood offcuts to be in accordance with manufacturers instructions.
Steel Unequal Angle with waterproof and oilproof compressible membrane seal (Unisil 3208-50) is to be bolted to wall and floor using M12x65 long masonry anchor with square galvanised steel washers.

Install caution signs warning of trip hazard as per DWG 6819-A4C

MATERIAL: 100x75x6UA Structural steel angle. Hot dipped galvanised.

FINISH: 80x50x6 Flat Structural Steel.
1. CABLE SUPPORT BRACKETS TO BE BRACED TO ENDWALLS
2. ALL CABLE SUPPORT BRACKETS & CABLE TRAY/LADDER TO BE EARTHED by 70mm cable.
NOTES
1. All dimensions in millimetres.
2. The hatchway is to provide a clear opening of 2500 x 3000.
3. All cut ends and welded areas are to be wire brushed then given 2 coats of galv. paint.
NOTES.

All conduits to be sealed between Consumer’s substation and cable pit or conduit at base of pole termination Duct seals to be located at 50mm from end of conduit.

* Item 4,5,6 and 7 - Order as Required.

As an additional measure to ensure water sealing, an approximate 20mm cured layer of polyurethane expanding foam (expands 1.5 to 2 times applied thickness) is to be applied as a void filler to cover the end of the cable duct sealing system (1) and a barrier membrane/skin of Silicone Rubber Sealant (Neutral Cure) is to be applied over the cured foam (ensuring centre void is filled/covered).

Vacant ducts can be sealed with mechanical zinc plated pressed steel test plugs ("Plumbers Plugs")

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<td>ROSS-100</td>
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<td>7</td>
<td>PLUMBERS PLUGS</td>
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<td>22870</td>
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GENERAL CONSTRUCTION INFORMATION
Sealing Cable Ducts
To prevent water & oil ingress/egress

7882-A4

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Venergex

APPD: G.Bartlett
OKD: A.Tieken
DRN: D.Longley
NOTES

DIMENSIONS: ALL DIMENSIONS IN MILLIMETRES.

TOLERANCES: ±2.0 UNLESS OTHERWISE STATED.
HOLE POSITIONING ±1.0
HOLE SIZE ±0.5

MATERIAL: STRUCTURAL STEEL TO BE GRADE TO AS3679.1-250
106x75x10QUA UNEQUAL ANGLE STEEL.

FABRICATION: AS REQUIRED.
REMOVE ALL BURRS AND SHARP EDGES.

FINISH: HOT DIPPED GALVANISED AFTER FABRICATION IN ACCORDANCE WITH
AS1650. MINIMUM COATING THICKNESS 84 µm.

QUANTITY:
(a) AS REQUIRED.
(b) UNEQUAL ANGLE STEEL ARE TO BE SUPPLIED AND FIXED IN
POSITION BY ENERGEX USING 12dia. ‘DYNABOLTS’ OR SIMILAR.

STORES SC.  12431

REFERENCES DRAWING No. LDSTO-ST001-01
PLAN - Trench Covers Removed

General Construction Information
Fixing steel channels across a 'T' intersection cable trench.
For support of electrical equipment

7884-A4
NOTE: Correct placement & level to be achieved by welding to the reinforcement.

TEMPORARY BOLT
MATERIAL: Nylon
ALL DIMENSIONS ARE IN MILLIMETRES EXCEPT WHERE SHOWN IN PARENTHESES
NOTES:

1. All existing Plant items must have their measurements checked before installation.
2. Safety Rails (Stores SC 12431) must be fixed to concrete floor for installation or removal of Transformer by 4-M12x65 masonry anchors.
NOTE:
1. Install consumers LV. cables on opposite side of the trench wall when a second transformer is installed.
2. LV. Meter Box includes, LV monitoring Meter (SC 17726), MODEM (SC 21208) and Meter Test Block (SC 5051).
NOTES
1. Material: 2mm Aluminum sheet for Top, Sides & Back cover & 3mm ABS Plastic for inspection cover.
2. Rivet or Screw the Top, Sides & Back cover to the LV Cable support stand.
3. ABS Inspection Cover to be secured with Padlock or SS Bolt & Nut.
4. Modify Cutout on-site to suit the Transformer used.
6. Stores SC S15787

General Construction Information
LV Terminal Guard
For 11kV/433V Cable Box Transformers
7889-A4
Notes

Where consumer connects to the transformer direct, Energex will supply the following items:

1. The Surge Diverter Kit (DSGTLVSD)
2. The CT's from the MOI Kit for relevant size of transformer supplied.
3. Common Earthing Plate and Neutral/MEN Cables Kit (OSTRFMEM) and (DISTRFSEN if required)

The consumer will supply the following items:

4. Flexible Connectors 670A "ALM" RS670A or "Burnery" CS233
5. Adapter Plates 100x6 or 101.6x6.3 HCU "Burnery" CS244 (surface flatness shall be ±0.2mm, all holes drilled & de-burred)
6. LV Cable Support Stand "UNISTRUT" Q2-5454 or similar.
7. LV Terminal Guard. (Can be supplied by "UNISTRUT")
8. Structural Hardwood Cable Support Cleats (Can be supplied by "UNISTRUT")
9. Torque Settings of 40Nm are recommended. Ulter Catalogue for 12mm bolts.
   a) M12 stainless steel bolts and M12 stainless steel beville washers.
      Threads of all SS bolts will be coated with electrical anti-seize grease.
      Use "AMPOL Jet-Lube Koppi-Kote".
   b) When cables run in the same trench the consumer is to install P1000CI Unistrut in the side walls of the trench to attach to LV mains. These mains to be of Energex 11KV cables.

Energex LV Cables Installed on Transformer

a) The LV transformer cable shall be supported on a cable support frame.
   b) Connected to the transformer terminals using flexible connectors/braids and adaptor plates.
   c) Exposed LV terminations to be covered by an LV guard fixed to a support frame.
   d) Cables to be fixed to support frame by seasoned hardwood cleats.
   e) All of the above accessories are standard Energex store stock.

* Not required for dry type transformers.
TOP ENTRY LV CABLE STAND

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<td>2</td>
<td>M5/S MASONRY ANCHOR</td>
<td>4</td>
<td>S06500</td>
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<td>4</td>
<td>½ HOLE CABLE CLEAT</td>
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<td>6</td>
<td>M8X25 5/STEEL HEXAGON SETSCREW</td>
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<td>7</td>
<td>M5 5/STEEL HEXAGON NUT</td>
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<td>FIXINGS AS REQUIRED</td>
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NOTES TOP & BOTTOM ENTRY
1. ALL UNISTRUT (or SIMILAR TO BE NOT DIPPED GALVANISED, INCLUDING ALL CUT ENDS. TOLERANCES ON ALL DIMENSIONS. UP TO 500mm ±10mm OVER 500mm ±15mm.
2. FOR CONSTRUCTION THE KIT ITEMS WILL BE SUPPLIED UNDER THE FOLLOWING SC’s:
   1) LV TERMINAL GUARD (SC S15787) TO BE ATTACHED TO UNISTRUT CHANNELS.
   2) LV CABLE UNIVERSAL SUPPORT STAND (SC S34694).
   3) UNISTRUT KIT FOR CONVERSION TO TOP ENTRY CABLE SUPPORT. 2x4 REQUIRED (SC S15788).
   4) LV CABLE CLEATS (SC S13225 & S15788).
3. LV PASSING COVER MUST BE SECURED WITH BOLT & NUT UNDER SPECIAL CIRCUMSTANCES A PADLOCK MAY BE USED.

GENERAL CONSTRUCTION INFORMATION
LV Cable Stands
For Oil Filled Transformers
Materials & Estimation Models
7892-A4

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APPD: G.Bartlett
OKD: A.Tienken
DRN: D.Langley

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GENERAL ARRANGEMENT
NOTE: LV GUARD NOT SHOWN

NOTE: 'a' phase not shown

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<td>SURGE DIVERTER CONNECTOR BAR</td>
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<td>CRIMP LUG 35mm M10 HOLE</td>
<td>6256</td>
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<td>4</td>
<td>19/1.53mm PVC Cu CABLE</td>
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<td>M10 x 25 SS HEXAGON SETSCREW</td>
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<td>M10 SS FLAT WASHER</td>
<td>1052</td>
<td>2</td>
</tr>
<tr>
<td>5b</td>
<td>M10 SS SPRING WASHER</td>
<td>1080</td>
<td>1</td>
<td>5c</td>
<td>M10 SS HEXAGON NUT</td>
<td>13225</td>
<td>1</td>
</tr>
</tbody>
</table>

ESTIMATION MODEL ID.'s

DSGTLVSD

Generall Construction Information
LV Surge Diveters
Assembly Information
Material & Estimation Models
7894-A4

energex
© Copyright 2011
APPD: D. Lloyd
OKD: U. Hoffman
DRN: D. Langley
### Notes

1. All connections should be cleaned and filed with no high spots.
2. Electrical Anti-seize grease should be used on the threads of all SS Bolts when assembling.
4. When upgrading 50k to 750kV, it is necessary to increase item 5 from 2 (phase) - 2 (IN to 3 (phase) - 3 (IN).

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>SC</th>
<th>315kVA</th>
<th>500kVA</th>
<th>750kVA</th>
<th>1000kVA</th>
<th>1500kVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M12 x 60 S/S BOLT &amp; NUT</td>
<td>414</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M12 x 50 S/S BOLT &amp; NUT</td>
<td>413</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>M12 x 45 S/S BOLT &amp; NUT</td>
<td>412</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>M12 x 30 S/S BOLT &amp; NUT</td>
<td>411</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>FLEXIBLE CONNECTOR (60kA)</td>
<td>4670</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>ADAPTER PLATE (100 x 6 OR 1016 x 6 MCU)</td>
<td>14673</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>300mm thick M12 HOLE Cu GRMD LUGS</td>
<td>14258</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>300mm thick XLPE Cable Red (nominal 6m length)</td>
<td>7185</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3       *</td>
</tr>
<tr>
<td>9</td>
<td>1/2&quot; BELLEVILLE WASHERS for M12 Bolts.</td>
<td>1089</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>LARGE DIAMETER 1/2&quot; Hole FLAT SS WASHERS for M12 Bolts.</td>
<td>17439</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

**ESTIMATION MODEL ID.'s**
- DSGTFB3
- DSGTFB5
- DSGTFB7
- DSGTFB10
- DSGTFB15

---

**General Construction Information**

Assembly of Flexible Leads, Adapter plates
Cable & Cable Lug Models

Supplied by ENERGEX

7895-A4
### NOTES
1. All connections should be cleaned and filed with no high spots.
2. Electrical Anti-seize grease should be used on the threads of all SS Bolts when assembling. Use "AMFOL JET-LUBE KOPR-KOTE".
3. LV Diverters kit supplied by ENERGEX as required.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>MATERIAL QUANTITY PER PHASE &amp; NEUTRAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>315kVA</td>
</tr>
<tr>
<td>1</td>
<td>M12 x 60 S/S BOLT &amp; NUT</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>M12 x 50 S/S BOLT &amp; NUT</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>M12 x 40 S/S BOLT &amp; NUT</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>M12 x 30 S/S BOLT &amp; NUT</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>FLEXIBLE CONNECTOR</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>&quot;ALM&quot; or &quot;APP&quot; RS670S or &quot;BURNDY&quot; CS233</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>ADAPTER PLATE 100 x 6 OR 1016 x 6.3 MAC &quot;BURNDY&quot; CS244</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>CRIMP LUGS WITH M12 HOLE TO SUIT CONSUMER'S MAINS</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>AS REQUIRED</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>AS REQUIRED</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>1/2&quot; BELLEVILLE WASHERS for M12 Bolts</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>LARGE DIAMETER 1/2&quot; HOLE FLAT SS WASHER for M12 Bolts</td>
<td>6</td>
</tr>
</tbody>
</table>

### General Construction Information
Assembly of Flexible leads, Adapter plates
Cable & Cable Lugs
Materials supplied by Electrical Contractors

© Copyright 2002

APP:D. Barnett
CKD: A. Tiekam
DRN: D. Longley

7896-A4
LV PHASING POSITIONS FOR CT’s

<table>
<thead>
<tr>
<th></th>
<th>c</th>
<th>b</th>
<th>a</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>c</td>
<td></td>
<td>b</td>
<td>a</td>
<td>n</td>
</tr>
<tr>
<td>a</td>
<td>c</td>
<td>b</td>
<td>a</td>
<td>n</td>
</tr>
</tbody>
</table>

TERMINAL MARKINGS
REGIONAL
METROPOLITAN

GENERAL ARRANGEMENT

Notes:
1. LV guard and surge diverters not shown
2. For dry type units, the CT’s premounted over the Transformer terminals and mounted inside LV cable Box.

CURRENT TRANSFORMER CONNECTION DATA

<table>
<thead>
<tr>
<th>LV Monitoring Meter</th>
<th>CT. SC</th>
<th>CT. RATIO</th>
<th>315kVA</th>
<th>500kVA</th>
<th>750kVA</th>
<th>1000kVA</th>
<th>1500kVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>22452</td>
<td>22362</td>
<td>800/5</td>
<td>S1·S2</td>
<td>S1·S2</td>
<td>S1·S2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22453</td>
<td>22363</td>
<td>1500/5</td>
<td>S1·S2</td>
<td>S1·S2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

General Construction Information

Typical arrangement for connection of CT’s and LV Monitoring Meter

7897-A4
LV Monitoring Meter Box.

CT'S PREWIRED TO LV. MONITORING METER.

 план View

LINE DIAGRAM

Front Elevation

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>QTY</th>
<th>STORES SC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>750kVA</td>
</tr>
<tr>
<td>1</td>
<td>CURRENT TRANSFORMER EXTENDED 200% LONG RANGE</td>
<td>3</td>
<td>22362</td>
</tr>
<tr>
<td>2</td>
<td>LV. MONITORING METER</td>
<td>1</td>
<td>22452</td>
</tr>
<tr>
<td>3</td>
<td>METER TEST BLOCK</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>MODEM</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

NOTE:
CT'S PREWIRED TO LV MONITORING METER BOX.
LV SURGE DIVERTERS SUPPLIED & INSTALLED BY ENERGEX.
FLEXIBLE BRAID CONNECTORS
STORES SC 4670

ADAPTOR PLATE
STORES SC 14673

2-HOLES
0.4
60
200
385

3-HOLES
0.4
65
100
25

2-HOLES
0.4
100
170

4-HOLES
0.4
100
50

2-SAW CUTS

TOP VIEW

SAW CUT

FRONT VIEW

30
325

30

2-HOLES
0.4
200

SAW CUT

TOP VIEW

2-HOLES
0.4

TOP VIEW

2-SAW CUTS

SAW CUT

TOP VIEW

2-SAW CUTS

SAW CUT

TOP VIEW

4-WAY CABLE CLEAT
STORES SC 16497

4-WAY CABLE CLEAT
STORES SC 14671

NOTES:
1. MATERIALS FOR ADAPTOR PLATE IS 1006 OR 1018x2.3 REU HARD DRAWN TO A3567-11B.
2. SURFACE FLATNESS ACROSS COPPER SHALL BE ±0.0002.
3. ALL HOLES SHALL BE DRILLED, BURRS & SHARP EDGES TO BE REMOVED.
4. CABLE CLEATS MADE FROM 1/4" SEASONED STRUCTURAL HARDWOOD AND DRIED FROM 175 x 50, 100 x 50, OR 50 x 50 NOMINAL TIMBER.
   WHEN USING 50x50 TIMBER, 5mm TIMBER OR HARDBOARD SHOULD BE USED AS A SPACER BEFORE CABLE HOLES ARE DRILLED.
5. ALL STAINLESS STEEL BOLTS SHALL HAVE ANTI-SEIZE GREASE (AEMCO 1530) "AMPOL JET"-LUBE TOP-RITE APPLIED TO THE THREADS.
6. ALL CONNECTIONS SHOULD BE CLEANED AND FIRED WITH NO HIGH SPOTS.

General Construction Information
LV Flexible Leads, Adapter plates &
Cable cleats
7899-A4
Notes:
1. A minimum air delivery volume of 1330 litres/second must be provided for each transformer.
2. Ventilation ducting and shafts that are installed inside the substation must not reduce other clearances specified in this document.
3. The ventilation system must be designed by a practicing Mechanical Engineer and certification passed on to ENERGEX before installation.
4. In top entry situations ventilation ducting must not be located where cables and/or cable trays are to be installed or over the top of any plant item.
Notes:
1. All holes shall be drilled. Burrs and sharp edges to be removed.
2. Cable cleats made from F17 seasoned structural hardwood.
3. 12mm threaded rod (cut to size) and nuts to be supplied with cleats.
4. All stainless steel bolts shall have anti-seize grease (in 16390) "Ampol Jet - Lube KÖPR KOTE" applied to the threads.
## MATERIAL LIST

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>COMPONENT REQUIRED FOR CONSTRUCTION DESCRIPTION</th>
<th>QUANTITY</th>
<th>STOCK CODE</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>NUT; UNISTRUT / P1010/M12</td>
<td>2</td>
<td>10885</td>
</tr>
<tr>
<td>2</td>
<td>WASHER FLAT; STAINLESS STEEL, M12</td>
<td>6</td>
<td>1053</td>
</tr>
<tr>
<td>3</td>
<td>NUT; PLAIN, HEX, STAINLESS STEEL, M12</td>
<td>6</td>
<td>622</td>
</tr>
<tr>
<td>4</td>
<td>ROD, CONTINUOUS THREAD. STEEL ZINC PLATED, M12</td>
<td>2 x 300mm</td>
<td>8615</td>
</tr>
<tr>
<td>5</td>
<td>SPRING, SINGLE COIL STAINLESS STEEL, M12</td>
<td>2</td>
<td>1081</td>
</tr>
<tr>
<td>6</td>
<td>CABLE CLEAT FOR WEBBER LV SWITCHBOARDS, HARDWOOD TO SUIT CABLE 32MM (4A); 4 PARTS; REFER DWG 8441 – A4</td>
<td>1</td>
<td>19829</td>
</tr>
</tbody>
</table>

CU No. WOODCABCLEAT

---

### Diagram

- **1**: NUT; UNISTRUT / P1010/M12
- **2**: WASHER FLAT; STAINLESS STEEL, M12
- **3**: NUT; PLAIN, HEX, STAINLESS STEEL, M12
- **4**: ROD, CONTINUOUS THREAD. STEEL ZINC PLATED, M12
- **5**: SPRING, SINGLE COIL STAINLESS STEEL, M12
- **6**: CABLE CLEAT FOR WEBBER LV SWITCHBOARDS, HARDWOOD TO SUIT CABLE 32MM (4A); 4 PARTS; REFER DWG 8441 – A4

---

**WOODEN CABLE CLEAT KIT**

FOR LOW VOLTAGE SWITCHBOARDS

ASSEMBLY DRAWING

8441-A4

Sheet 2 of 2

© Copyright 2006

APP'D: K.Nu Hall

C.O: R.Krosch

DRN: J. Sokac

File: c8/t18441-A4-2.dwg
SCOPE OF WORK

1. CONCRETE BASE SLAB AND BLOCK WALLS INSTALLED BY DEVELOPER BEFORE RMU INSTALLATION.
2. EARTH GRID SUPPLIED AND INSTALLED TOGETHER WITH RMU BY ENERGEX.
3. SAND BACKFILL AROUND CABLES AND INSTALL SURROUND SLAB BY DEVELOPER AFTER RMU INSTALLATION.
4. TWO PARALLEL BLOCK WALLS CAN BE BUILT UNDER EITHER END OF ISOLATOR TO SUIT CABLE INSTALLATION.
5. EARTH GRID REQUIREMENT SHALL BE 1 ohm MAX. WHEN RMU CUBICLE INSTALLED ON FOOTPATH.

Concrete Strengths

<table>
<thead>
<tr>
<th>Type</th>
<th>Fc</th>
<th>Slump</th>
<th>Aggregate Size (Max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footing</td>
<td>25MPa</td>
<td>75</td>
<td>20mm</td>
</tr>
<tr>
<td>Blackwork/ Core Filling</td>
<td>20MPa</td>
<td>150</td>
<td>10mm</td>
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</tbody>
</table>

ABB 3-WAY ISOLATOR
CUBICLE MOUNTED BLOCK FOUNDATION
FOR LEVEL SLOPE
(INSTALLLED ON FOOTPATH)

8991-A4

Venergex
© Copyright 2006

APPD: K. NUTTALL
CRD: R. KROSCHE
DRN: G. JAYAWEERA

File: e:\s11\8991-A4.dwg
NOTES:
1. REFER TO DWG LOSTD-CV009-05 FOR DETAILS OF CIVIL FOUNDATION WORKS.
2. EARTH TAILS TO BE EXTENDED ALONG FOOTPATH IF 1000mm CANNOT BE ACHIEVED.

OUTDOOR ENCLOSURE DETAIL

<table>
<thead>
<tr>
<th>DIM &quot;A&quot;</th>
<th>CFC,CCC</th>
<th>CFCC,CCCC</th>
<th>CFCF</th>
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</thead>
<tbody>
<tr>
<td>810</td>
<td>1015</td>
<td>1235</td>
<td></td>
</tr>
<tr>
<td>DIM &quot;B&quot;</td>
<td>770</td>
<td>975</td>
<td>1195</td>
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SafeLink with ABB stand

<table>
<thead>
<tr>
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<th>CFC,CCC,CF</th>
<th>CFCC,CCCC, CFCD</th>
<th>CFCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEIGHT (mm)</td>
<td>1350</td>
<td>1350</td>
<td>1350</td>
</tr>
<tr>
<td>WIDTH (mm)</td>
<td>720</td>
<td>915</td>
<td>1550</td>
</tr>
<tr>
<td>DEPTH (mm)</td>
<td>700</td>
<td>700</td>
<td>700</td>
</tr>
<tr>
<td>WEIGHT (Kg)</td>
<td>250</td>
<td>270</td>
<td>350</td>
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</tbody>
</table>

* Note that extended height plinths are available to increase standard height to 1650 mm

Optional Outdoor Enclosure

<table>
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<th></th>
<th>CFC,CCC,CF</th>
<th>CFCC,CCCC</th>
<th>CFCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEIGHT (mm)</td>
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<td>1380</td>
<td>1380</td>
</tr>
<tr>
<td>WIDTH (mm)</td>
<td>810</td>
<td>1015</td>
<td>1235</td>
</tr>
<tr>
<td>DEPTH (mm)</td>
<td>838</td>
<td>838</td>
<td>838</td>
</tr>
<tr>
<td>WEIGHT (Kg)</td>
<td>94</td>
<td>106</td>
<td>122</td>
</tr>
</tbody>
</table>

All Dimensions are in mm

General Construction Information
SafeLink (SF6) Insulated Ring Main Unit Outdoor Enclosure with Box Culvert Option
8993-A4
NOTES:

1. INVERT BOX CULVERTS TO AS 1597, AND COMPLYING TO MRD (QLD) SPECIFICATION FORM 61R. THESE ITEMS ARE NON-STANDARD - SO EARLY ORDERING IS REQUIRED.

2. INVERT BOX CULVERTS TO BE FILLED WITH APPROVED FILLING BY ENERGEX, WHICH SHALL BE SOLIDLY PACKED AND CAREFULLY HAND RAMMED AFTER CABLES HAVE BEEN INSTALLED. APPROVED FILLING AND BEDDING MATERIAL SHALL COMPRISE FINE SAND OR STONE FREE FRIABLE LOAM. CABLE TRENCHING SHALL NOT BE BACKFILLED WITH CLAY OR ROCK.

3. REFER TO DWG LOSTD-CV009-05 FOR DETAILS OF CIVIL FOUNDATION WORKS.
NOTES:

1. INVERT BOX CULVERTS TO AS 1597, AND COMPLYING TO MRD (QLD) SPECIFICATION FORM 61R. THESE ITEMS ARE NON-STANDARD - SO EARLY ORDERING IS REQUIRED.

2. INVERT BOX CULVERTS TO BE FILLED WITH APPROVED FILLING BY ENERGEX, WHICH SHALL BE SOLIDLY PACKED AND CAREFULLY HAND RAMMED AFTER CABLES HAVE BEEN INSTALLED. APPROVED FILLING AND BEDDING MATERIAL SHALL COMPRISSE FINE SAND OR STONE FREE FRIOABLE LOAM. CABLE TRENCHING SHALL NOT BE BACKFILLED WITH CLAY OR ROCK.

3. REFER TO DWG LOSTD-CV009-05 FOR DETAILS OF CIVIL FOUNDATION WORKS.
Install 2 x 1800 earth rods in this location

Fill with weak mix concrete (SC 17752)

Back fill with concrete

Trim steel guide rail level with concrete floor

FOOTPATH
PLAN

PLAN FOR CABLE CUTOUT

SECTION A

SECTION B

EQUIPMENT LAYOUT
FOR SQUARE TYPE PADMOUNT
IN EXISTING GROUND TYPE SUBSTATIONS
8997-A4
Cable conduit shall be of the following type-
125mm Dia. UPVC Light Duty Rigid Pressure pipe to AS2053. Conduit bends shall have a
Minimum radius of 1830mm.

The conduits shall be laid in a straight line with sealed joints. Should any deviation be required in
conduit route, 1830mm radius bends shall be used. Bends shall not be greater than 30 degrees.
Cable pits shall be used for greater deviations. Refer to ENERGEX Planner for details.

The conduits shall have 750mm minimum cover and shall be bedded on compacted sand or fine granular
soil free of rocks. The socket ends of conduits shall finish 150mm beyond the R.P. alignment and shall
have 750mm min cover below finished footpath level at the R.P. alignment.
A bellmouth shall be provided where the conduits terminate in the substation wall or wall of a
substation trench. A 2.5mm plastic coated steel draw wire or 6mm braided Polypropylene Rope
“BORAL KA10850” shall be left in each conduit.

ENERGEX may need to install an earth wire and earth rods in conduit trenches from the
substation site.

Electricity Supply Conduits and Cables shall have polymeric cable protection covers placed
100mm above the top conduit face of the electricity supply conduits and cables. Cable protection covers
shall be lapped when placed together, 100mm minimum along the longitudinal axis, 40mm minimum
along the traverse axis and shall extend 40mm minimum past the external edges of the conduit/cable
bank.

Polymeric cable protection cover shall be a minimum of 5mm thick as described in the relevant
Australian Standard.

NOTE
1. INSTALL A NEW COMMUNICATIONS CONDUIT OF MINIMUM SIZE, 100mm LD PVC WHITE CONDUIT, LOCATED AT THE
TOP LEVEL KERB SIDE OF THE CONDUIT BANK.
Cable conduit shall be of the following type:-
125mm Dia. UPVC Light Duty Rigid Pressure pipe to AS2053. Conduit bends shall have a
Minimum radius of 1830mm.

The conduits shall be laid in a straight line with sealed joints. Should any deviation be required in
conduit route, 1830mm radius bends shall be used. Bends shall not be greater than 30 degrees.
Cable pits shall be used for greater deviations. Refer to ENERGEX Planner for details.

The conduits shall have 750mm minimum cover and shall be bedded on compacted sand or fine granular
soil free of rocks. The socket ends of conduits shall finish 150mm beyond the R.P. alignment and shall
have 750mm min cover below finished footpath level at the R.P. alignment.
A bellmouth shall be provided where the conduits terminate in the substation wall or wall of a
substation trench. A 2.5mm plastic coated steel draw wire or 6mm braided Polypropylene Rope
"BORAL KA10850" shall be left in each conduit.

Because of the physical distortion likely in large groups of buried UPVC conduits, High Density
conduits shall be used for groups of more than 6 conduits. Conduits shall be
125mm or 150mm as specified by ENERGEX and shall be supplied and installed by the developer.
Conduits shall be securely sealed by builder to prevent ingress of dirt until cable installation
by ENERGEX and then resealed by ENERGEX.

ENERGEX may need to install an earth wire and earth rods in conduit trenches from the
substation site.

Electricity Supply Conduits and Cables shall have polymeric cable protection covers placed
100mm above the top conduit face of the electricity supply conduits and cables. Cable protection covers
covers shall be lapped when placed together, 100mm minimum along the longitudinal axis, 40mm minimum
along the traverse axis and shall extend 40mm minimum past the external edges of the conduit/cable
bank.

Polymeric cable protection cover shall be a minimum of 5mm thick as described in the relevant
Australian Standard.

NOTE
1. INSTALL A NEW COMMUNICATIONS CONDUIT OF MINIMUM SIZE, 100mm LD PVC WHITE CONDUIT, LOCATED AT THE
   TOP LEVEL KERB SIDE OF THE CONDUIT BANK.
100 x 75 x 10 UA STRUCTURAL STEEL UNEQUAL ANGLE
TO BE SUPPLIED COMPLETE WITH M12 x 40 LONG HEX HEAD BOLT
AND M12 UNISTRUT NUT - 2 OFF OF EACH - ALL GALVANISED

NOTES:
1. ALL DIMENSIONS IN MILLIMETRES.
2. ALL ANGLES TO BE HOT DIP GALVANISED AFTER FABRICATION.
3. 2 ANGLES REQUIRED FOR EACH FOUNDATION
4. ANGLES TO BE SUPPLIED AND FIXED INTO POSITION BY ENERGEX
   USING M12 x 40 LONG HEX HEAD BOLTS AND UNISTRUT NUTS SUPPLIED
5. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
   THE FOLLOWING QUALITY ASSURANCE NOTES:
   DROUAL-ST001-01: FABRICATION - TOLERANCING
   DROUAL-ST001-02: FABRICATION - FINISH
   DROUAL-ST001-03: FABRICATION - HOT DIP GALVANISING
   DROUAL-MD001-02: MATERIALS - STRUCTURAL STEEL

DRAWING REFERENCE
RING MAIN UNIT FOUNDATION..........LOSTO-ST001-02

STOCK CODE: 18634