OVERHEAD CONSTRUCTION MANUAL

Section 7 – Pole Mounted Plant

Approved by: C Noel
# Overhead Construction Manual

## Pole Mounted Plant

### POLE TRANSFORMERS

<table>
<thead>
<tr>
<th>Description</th>
<th>Section/Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthing Schematics</td>
<td>7-1</td>
</tr>
<tr>
<td>HV Bridging Arrangements to Transformer</td>
<td>7-2</td>
</tr>
<tr>
<td>King Bolt Spacings - LVABC Network</td>
<td>7-3</td>
</tr>
<tr>
<td>King Bolt Spacings - Open Wire Network</td>
<td>7-4</td>
</tr>
<tr>
<td>25kVA Schematic and Material List</td>
<td>7-5</td>
</tr>
<tr>
<td>11kV 25kVA 1Ø &amp; 3Ø supply to Services</td>
<td>7-6</td>
</tr>
<tr>
<td>25kVA Schematic and Material List</td>
<td>7-7</td>
</tr>
<tr>
<td>63kVA 11kV 25 &amp; 63kVA 3Ø supply to LVABC &amp; Open Wire Network</td>
<td>7-8</td>
</tr>
<tr>
<td>100kVA Schematic and Material List</td>
<td>7-9</td>
</tr>
<tr>
<td>11kV 100kVA 3Ø supply to LVABC &amp; Open Wire Network</td>
<td>7-10</td>
</tr>
<tr>
<td>200kVA Schematic and Material List</td>
<td>7-11</td>
</tr>
<tr>
<td>11kV 200kVA 3Ø supply to LVABC &amp; Open Wire Network</td>
<td>7-12</td>
</tr>
<tr>
<td>315kVA Schematic and Material List</td>
<td>7-13</td>
</tr>
<tr>
<td>11kV 315kVA 3Ø supply to LVABC &amp; Open Wire Network</td>
<td>7-14</td>
</tr>
<tr>
<td>500kVA Schematic and Material List</td>
<td>7-15</td>
</tr>
<tr>
<td>11kV 500kVA 3Ø supply to LVABC &amp; Open Wire Network</td>
<td>7-16</td>
</tr>
</tbody>
</table>

### 11kV VOLTAGE TRANSFORMERS

<table>
<thead>
<tr>
<th>Description</th>
<th>Section/Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11kV VT (Wood Pole)</td>
<td>7-31</td>
</tr>
<tr>
<td>11kV VT (Wood Pole)</td>
<td>7-32</td>
</tr>
</tbody>
</table>

### HV Bridging to Transformer

<table>
<thead>
<tr>
<th>Description</th>
<th>Section/Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>HV Bridging to Transformer</td>
<td>7-53</td>
</tr>
<tr>
<td>HV Bridging to Transformer</td>
<td>7-54</td>
</tr>
<tr>
<td>HV Bridging to Transformer</td>
<td>7-55</td>
</tr>
<tr>
<td>HV Bridging to Transformer</td>
<td>7-63</td>
</tr>
<tr>
<td>Transformer LV Isolation &amp; Neutral Bus Assy</td>
<td>7-74</td>
</tr>
<tr>
<td>Neutral Bridging from Neutral Bushing Palm</td>
<td>7-79</td>
</tr>
<tr>
<td>Phase Bridging from Isolator to Mains</td>
<td>7-80</td>
</tr>
<tr>
<td>Phase Bridging from Phase Bushing Palm</td>
<td>7-81</td>
</tr>
<tr>
<td>11LBSMP/UG Pole Termination</td>
<td>7-82</td>
</tr>
<tr>
<td>1TREC/N0JAFF/UG Pole Termination</td>
<td>7-83</td>
</tr>
<tr>
<td>LVFM LVFMA Low Voltage Feeder Monitor</td>
<td>7-90</td>
</tr>
<tr>
<td>MDI construction &amp; connection</td>
<td>7-91</td>
</tr>
<tr>
<td>LV monitoring CT Wiring Arrangement</td>
<td>7-92</td>
</tr>
<tr>
<td>LV monitoring CU List</td>
<td>7-93</td>
</tr>
<tr>
<td>LV monitoring Construction &amp; Connection</td>
<td>7-94</td>
</tr>
</tbody>
</table>

---

Uncontrolled Document when Printed
<table>
<thead>
<tr>
<th>CU</th>
<th>DESCRIPTION</th>
<th>SECTION / PAGE</th>
<th>CU</th>
<th>DESCRIPTION</th>
<th>SECTION / PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>11LBSPTFFF</td>
<td>11kV Manually Operated Load Break Switch to UG Term. (NGK) FULLY FITTED</td>
<td>7-95</td>
<td>11REC/NOJA</td>
<td>11kV Recloser, 3Ø construction (NOJA)</td>
<td>7-205</td>
</tr>
<tr>
<td>11LBSMPFF</td>
<td>11kV Manually Operated Load Break Switch - Pole Top Mounted (NGK) FULLY FITTED</td>
<td>7-96</td>
<td>11REC/NOJAFF</td>
<td>33kV Recloser, 3Ø construction (Schneider N series)</td>
<td>7-206</td>
</tr>
<tr>
<td>11LBSPT</td>
<td>11kV Manually Operated Load Break Switch - Pole Top Mounted (NGK)</td>
<td>7-97</td>
<td>33REC/638</td>
<td>33kV Recloser, 3Ø construction (Noja OSM38)</td>
<td>7-211</td>
</tr>
<tr>
<td>11BSPT</td>
<td>11kV Manually Operated Load Break Switch - Pole Top Mounted (NGK)</td>
<td>7-98</td>
<td>33REC/NOJAFF</td>
<td>33kV Recloser, 3Ø construction (Noja OSM38)</td>
<td>7-212</td>
</tr>
<tr>
<td>11LBSPTFFS</td>
<td>11kV Manually Operated Load Break Switch - Pole Top Mounted (LJIN) FULLY FITTED</td>
<td>7-99</td>
<td>10PC1</td>
<td>11kV S&amp;C Intellirupter Pulse Closer</td>
<td>7-213</td>
</tr>
<tr>
<td>11BSPFFS</td>
<td>11kV Manually Operated Load Break Switch - Mid Pole Mounted (LJIN) FULLY FITTED</td>
<td>7-100</td>
<td></td>
<td></td>
<td>7-214</td>
</tr>
<tr>
<td>11LBSPTFFS</td>
<td>11kV Manually Operated Load Break Switch - Pole Top Mounted (LJIN) FULLY FITTED</td>
<td>7-100</td>
<td></td>
<td></td>
<td>7-221</td>
</tr>
<tr>
<td>11LBSMPFFS</td>
<td>11kV Manually Operated Load Break Switch - Mid Pole Mounted (LJIN) FULLY FITTED</td>
<td>7-100</td>
<td></td>
<td></td>
<td>7-222</td>
</tr>
<tr>
<td>11ABSUM</td>
<td>11kV ABS construction - pole top &amp; mid pole (NGK)</td>
<td>7-101</td>
<td>11REG70MR</td>
<td>11kV 200A Regulator Station Construction (Open Deltal)</td>
<td>7-302</td>
</tr>
<tr>
<td>33ABSUM</td>
<td>33kV ABS construction - pole top &amp; mid pole (NGK)</td>
<td>7-102</td>
<td>11RGT</td>
<td>11kV Regulator Stations Construction Closed Delta 3 Tank (W Pole)</td>
<td>7-311</td>
</tr>
<tr>
<td>11LBSMP FF</td>
<td>11kV &amp; 33kV ABS operating rod assembly - pole top (NGK)</td>
<td>7-121</td>
<td></td>
<td></td>
<td>7-312</td>
</tr>
<tr>
<td>11LBSMPFF</td>
<td>11kV &amp; 33kV ABS operating rod assembly - mid pole (NGK)</td>
<td>7-122</td>
<td></td>
<td></td>
<td>7-321</td>
</tr>
<tr>
<td></td>
<td>ABS HV bridging arrangements</td>
<td></td>
<td></td>
<td></td>
<td>7-324</td>
</tr>
<tr>
<td>PAGE 7-155-1</td>
<td>Open wire to ABS palm</td>
<td>7-145</td>
<td></td>
<td></td>
<td>7-351</td>
</tr>
<tr>
<td>PAGE 7-155-2</td>
<td>Connector to surge arrester tail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE 7-155-3</td>
<td>HVAC to connector bracket &amp; palm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE 7-155-4</td>
<td>HVAC to ABS palm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE 7-255-1</td>
<td>Bridging - Reclosers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE 7-255-2</td>
<td>Open wire to Isolating Switch Palm (for older equipment only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE 7-255-3</td>
<td>HV Recloser Bushing (for older equipment only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE 7-255-3</td>
<td>HV Recloser Bushing to Isolating Switch (for older equipment only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LOAD BREAK SWITCHES (Manual)**

**AIR BREAK SWITCHES**

**RECLOSERS (Remote Controlled)**

**REGULATORS**

**LOAD BREAK SWITCHES (Remote Controlled)**

**METERING UNITS**

---

**OVERHEAD CONSTRUCTION MANUAL**

**POLE MOUNTED PLANT INDEX**

---

**energex**

*This drawing must not be reproduced in part or whole without written permission from ENERGEX*
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>SECTION / PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTCOM</td>
<td>7-601</td>
</tr>
<tr>
<td>PTSEP</td>
<td>7-602</td>
</tr>
<tr>
<td>ABSE</td>
<td>7-603</td>
</tr>
<tr>
<td>ABSES</td>
<td>7-604</td>
</tr>
<tr>
<td>33ABSES</td>
<td>7-604</td>
</tr>
<tr>
<td>HVE</td>
<td>7-605</td>
</tr>
<tr>
<td>HVEC</td>
<td>7-605</td>
</tr>
<tr>
<td>HVE1</td>
<td>7-606</td>
</tr>
<tr>
<td>HVE2</td>
<td>7-607</td>
</tr>
<tr>
<td>ABSE3</td>
<td>7-610</td>
</tr>
<tr>
<td>ABSE5</td>
<td>7-611</td>
</tr>
<tr>
<td>ABSE4</td>
<td>7-612</td>
</tr>
<tr>
<td>CGES</td>
<td>7-613</td>
</tr>
<tr>
<td>CGEC</td>
<td>7-614</td>
</tr>
<tr>
<td>HVE3</td>
<td>7-615</td>
</tr>
<tr>
<td>HVE4</td>
<td>7-616</td>
</tr>
<tr>
<td>PTCOMC</td>
<td>7-619</td>
</tr>
<tr>
<td>PTSEPC</td>
<td>7-620</td>
</tr>
<tr>
<td>CGE33</td>
<td>7-621</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bonding nailed &amp; steel butted wood pole air break switch or cable guard bond to pole nail - Earthing arrangement 7-630</td>
</tr>
<tr>
<td></td>
<td>Common / Single earth pole earths downleads (wood pole) anti-theft arrangement 7-631</td>
</tr>
<tr>
<td></td>
<td>Separate earth pole earths downleads (wood pole) anti-theft arrangement 7-632</td>
</tr>
</tbody>
</table>
HV ARRESTER CABLES
16sqmm Stranded Cu 11kV
PE/PVC INSULATED

TANK CONNECTION

HV ARRESTER MOUNTING PLATE

LV ARRESTER CABLES
50sqmm Cu PVC Black

LV ARRESTER CABLES
50sqmm Cu PVC Black

TANK EARTH LEAD
50sqmm Cu PVC Black

COMMON TANK/LV EARTH DOWNLEAD
50sqmm Cu PVC Black

CMEN AREA
COMMON TANK & LV EARTH

HV ARRESTER CABLES
16sqmm Stranded Cu 11kV
PE/PVC INSULATED

TANK CONNECTION

HV ARRESTER MOUNTING PLATE

LV ARRESTER CABLES
50sqmm Cu PVC Black

LV ARRESTER CABLES
50sqmm Cu PVC Black

TANK EARTH LEAD
50sqmm Cu PVC Black

COMMON TANK/LV EARTH DOWNLEAD
50sqmm Cu PVC Black

CMEN AREA
COMMON TANK & LV EARTH

NON CMEN AREA
SEPARATE EARTHS
(TIMBER POLES ONLY)
11kV MAINS CONNECTION

MAINS

LLC TO Cu MAINS PAGE7-53-1

LLC TO Al MAINS/CCT PAGE7-53-3
Strip CCT where T clamps attach

LLC TO STIRrup PAGE7-53-2 (Cu mains) PAGE7-53-4 (Al mains)

LLC TO Cu ROD STIRRUP PAGE7-55-1

THIS ARRANGEMENT ALSO SUITABLE FOR CONNECTING TO OPEN WIRE MAINS TAILS WITH PG CLAMP PAGE7-55-2

AL wire on Al/CCT mains
Cu rod on Cu mains

COVERED Cu Rod EDO TO TRF HV (PAGE 7-54-3)

EDO CONSTRUCTION (SECTION 4)

BEND ROD AWAY FROM EDO EARTH ATTACHMENT

HV EARTH POSITION

PROVISION FOR PARKING TOP LLC LEAD

35 sqmm annealed Cu PVC Ins Cable

Strip CCT where PG clamp attaches

Stirrup faces back towards crossarm

Top Bolt

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

TRANSFORMER HV BRIDGING

GENERAL ARRANGEMENTS

ENERGEX

COPYRIGHT 2009 ENERGEX

This drawing must not be reproduced in part or whole without written permission from ENERGEX
NOTE
2800 KBS is allowable at existing poles where trf is uprated to 315kVA or less and 3300 KBS cannot be achieved.
NOTE
2800 KBS is allowable at existing poles where TRF is uprated to 315kVA or less and 3300 KBS cannot be achieved.

4000 1PH PT
4500 3PH PT
6125

TOP KINGBOLT
FOOTPATH SIDE

HV EARTH POSITION

11kV CONSTRUCTION
SECTION 4

HV BRIDGING

EDD CONSTRUCTION
SECTION 4

EDD TO TRF HV

BOLT-ON TRANSFORMER TO POLE

LV BRIDGING TO FUSES/FUSE SWITCHES

TRF LV ISOLATION FUSES (UP TO 63kVA)

TRF LV ISOLATION FUSE SWITCHES
(100kVA & ABOVE)

LV OPEN WIRE CONSTRUCTION

EQUIPMENT INCLUDING LEADS AND CABLES
TO BE AT LEAST 2.6M ABOVE GROUND

NOTE (2800 see note)
# Material List

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
<th>Qty</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page 7-55-</td>
<td>BAIL &amp; LLC TO EDO</td>
<td>AR</td>
<td>AR</td>
</tr>
<tr>
<td>1ED02</td>
<td>EDO CONSTRUCTION 3ph - SECTION 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1ED03</td>
<td>EDO CONSTRUCTION 3ph - SECTION 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14228</td>
<td>EDO Fuse Link - 8A</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Page 7-54-3</td>
<td>EDO TO TRF HV</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>SET250-12</td>
<td>BOLT-ON BRACKET FOR 25kVA TRF</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>15641</td>
<td>LUG AT TRF NEUTRAL PALM (95sqmm Al)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Page 7-81-16</td>
<td>LV PHASE BRIDGE TRF TO FUSEHOLDER</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>17000</td>
<td>NEUTRAL BLOCK</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>22520</td>
<td>CAP (95sqmm)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SET1-2</td>
<td>1PH FUSEHOLDER BRACKET TO POLE</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SET2-1</td>
<td>3PH FUSEHOLDER BRACKET TO POLE</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>19910</td>
<td>100A FUSEHOLDER (6-95sqmm)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>04451</td>
<td>80A Fuse</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

11PT/25B - 25kVA (1Ph) HV OPEN WIRE, LV SERVICE
11PT/25WA-25kVA (3Ph) HV OPEN WIRE, LV SERVICE

---

### Overhead Construction Manual

**POLE MOUNTED PLANT**

**OVERHEAD CONSTRUCTION MANUAL**

25 kVA

SINGLE & 3 PHASE 11kV POLE TRANSFORMERS SUPPLY TO SERVICE

**Revised by**:

**Issue Date**:

**Copyright 2014 Energex**

---

**Energex**

This drawing must not be reproduced in part or whole without written permission from Energex.

---

**Tech Standards**

**4920-A4-J**

---

**Revised by**:

**Issue Date**:

**Sheet 1 of 1**
25 kVA 3Ph - Bridging to Service

SET250-12 (25kVA) BRACKET TO POLE

PAGE 7-54-3
EDO TO TRF HV

PAGE 7-81-16
PHASE BRIDGE TO FUSEHOLDER

FUSEHOLDERS
3 x 19910
FUSES 80A
3 x 04451

MOUNTING BRACKET
SET 2-1

TRANSFORMER
LUG 15641
NEUTRAL 95sqmm Al

HEAT SHRINK CAP
06616

NEUTRAL EARTH
50sqmm Cu

NEUTRAL BLOCK
17000
700 MIN FROM HV TERMINALS

BUSHING ARRANGEMENT SHOWN IS FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL ARRANGEMENT MAY VARY DEPENDING UPON MANUFACTURER.

TRANSFORMERS ARE SUPPLIED WITH SURGE ARRESTERS FITTED AND WIRED. ACTUAL ARRANGEMENT MAY VARY SLIGHTLY TO DRAWING.

This drawing must not be reproduced in part or whole without written permission from ENERGEX.

© COPYRIGHT 2011 ENERGEX
### Material List - 11PT/25ABC
11PT/25
11PT/63WA
11PT/63

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>DESCRIPTION</th>
<th>QTY</th>
<th>QTY</th>
<th>QTY</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAGE7-55-</td>
<td>BALL &amp; LLC TO EDO</td>
<td>AR</td>
<td>AR</td>
<td>AR</td>
<td>AR</td>
</tr>
<tr>
<td>11ED03</td>
<td>EDO CONSTRUCTION 3ph - SECTION 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14228</td>
<td>EDO FUSE LINK - 8A</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PAGE7-54-3</td>
<td>EDO TO TRF HV</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>SET250-12</td>
<td>BOLT ON TRANSFORMER BRACKET (25kVA)</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET250-1</td>
<td>BOLT ON TRANSFORMER BRACKET (63kVA)</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-81-11</td>
<td>LV PHASE BRIDGE TRF TO 1PH FUSE SWITCH</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-79-11</td>
<td>NEUTRAL BRIDGE TRF TO N-BUS</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-74-3</td>
<td>XARM, 3x1PH FUSE SWITCHES &amp; N-BUS</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>04450</td>
<td>100A FUSES FOR FUSE SWITCHES</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21281</td>
<td>80A FUSES FOR FUSE SWITCHES</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-80-16</td>
<td>BRIDGES - FUSE SWITCHES &amp; N-BUS TO MAINS</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20849</td>
<td>NEUTRAL TEST IPC</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-81-16</td>
<td>LV PHASE BRIDGE TRF TO FUSEHOLDER</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET2-1</td>
<td>3PH FUSEHOLDER BRACKET TO POLE</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19910</td>
<td>100A FUSEHOLDER (6-95sqmm)</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19946</td>
<td>100A FUSE FOR FUSEHOLDER</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04451</td>
<td>80A FUSE FOR FUSEHOLDER</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-80-11</td>
<td>LV PHASE BRIDGE FUSEHOLDER TO MAINS (OW)</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-79-11</td>
<td>NEUTRAL BRIDGE TRF TO MAINS (OW)</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

#### Overhead Construction Manual

**Pole Mounted Plant**

**25 & 63 kVA**

3 Phase 11kV Pole Transformers

Supply to LVABC and Open Wire Wood Pole
BUSHING ARRANGEMENT SHOWN IS FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL ARRANGEMENT MAY VARY DEPENDING UPON MANUFACTURER.

TRANSFORMERS ARE SUPPLIED WITH SURGE ARRESTERS FITTED AND WIRED. ACTUAL ARRANGEMENT MAY VARY SLIGHTLY TO DRAWING.

SET250-12 (25kVA)
SET250-1 (63kVA)
BRACKET TO POLE

PAGE 7-81-11
PHASE BRIDGE
1x35mm² Cu

PAGE 7-74-3
XARM, FUSES, & N-BUS
80A (25kVA)
100A (63kVA)

B & C PHASES MAINS TAILS
BRIDGING OMITTED FOR CLARITY

PAGE 7-79-11
NEUTRAL-N BUS
2x35mm² Cu

PAGE 7-79-11
NEUTRAL 35mm² Cu

SET2-1
3Ø PHASE BRACKET
FUSEHOLDERS
19910

FUSES 80A (25kVA)
04451
FUSES 100A (63kVA)
12454

LV CONSTRUCTION

SET250-12 (25kVA)
SET250-1 (63kVA)
BRACKET TO POLE

PAGE 7-81-16
PHASE BRIDGING TO FUSEHOLDER
35mm² Cu

PAGE 7-80-11
PHASE BRIDGING TO MAINS
35mm² Cu

NEUTRAL EARTH
50mm² Cu

25kVA
63kVA - BRIDGING TO LVABC MAINS

25kVA
63kVA - BRIDGING TO OPEN WIRE MAINS

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT
25 & 63 kVA
3 PHASE 11kV POLE TRANSFORMERS
SUPPLY TO LVABC AND OPEN WIRE WOOD POLE

OHC 7 Index

APP'D Kevin Boll
TECH STDS AUTOCAAD 4920-A4 K

DATE 02-12-92
RECD 7
SECTION 8
PAGE 8
SHEET 1 OF 1

DRN Updated LV neutral and earth for LVABC

COPYRIGHT 2018 ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX
<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>DESCRIPTION</th>
<th>QTY</th>
<th>QTY</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAGE7-55-</td>
<td>BAIL &amp; LLC TO EDO</td>
<td>AR</td>
<td>AR</td>
<td></td>
</tr>
<tr>
<td>PAGE7-55-1</td>
<td>BAR STRIP ASSY &amp; LLC TO EDO (HVABC)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11ED03</td>
<td>EDO CONSTRUCTION - SECTION 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14231</td>
<td>EDO FUSE LINK - 16A &quot;K&quot;</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PAGE7-54-3</td>
<td>EDO TO TRF HV</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>SET250-15</td>
<td>BOLT ON TRANSFORMER TO POLE</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PAGE7-81-12</td>
<td>LV PHASE BRIDGE TRF TO 1PH FUSE SWITCH</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PAGE7-79-12</td>
<td>NEUTRAL BRIDGE TRF TO N-BUS</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PAGE7-74-3</td>
<td>XARM, 3x1PH FUSE SWITCHES &amp; N-BUS</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>04665</td>
<td>160A FUSES FOR FUSE SWITCHES</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PAGE7-80-17</td>
<td>BRIDGES - FUSE SWITCHES &amp; N-BUS TO MAINS</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>20849</td>
<td>NEUTRAL TEST IPC</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PAGE7-79-17</td>
<td>NEUTRAL BRIDGE TRF TO MAINS NEUTRAL</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>SET3-2</td>
<td>LV 1PH 630A FUSE SWITCH TO X-ARM</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-80-12</td>
<td>LV PHASE BRIDGE 1PH FUSE SWITCH TO MAINS</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11PT/100WA  -  100kVA HV OPEN WIRE, LVABC
11PT/100AAL - 100kVA HVABC, LVABC
11PT/100   -  100kVA HV OPEN WIRE, LV OPEN WIRE

100kVA HV OPEN WIRE

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT
100kVA
3 PHASE 11kV POLE TRANSFORMER
SUPPLY TO LVABC AND OPEN WIRE - WOOD POLE
**100kVA - BRIDGING TO LVABC MAINS - 1x100kVA CIRCUIT**

**OVERHEAD CONSTRUCTION MANUAL**

POLE MOUNTED PLANT  
100 KVA  
3 PHASE 11 kV POLE TRANSFORMERS  
SUPPLY TO LVABC AND OPEN WIRE - WOOD POLE

---

**Note:** Transformers are supplied with surge arresters fitted and wired. Actual arrangement may vary slightly to drawing.
MATERIAL LIST -

CU CODES
11PT/200WA
11PT/200AAL
11PT/200

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>DESCRIPTION</th>
<th>QTY</th>
<th>QTY</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAGE7-53-</td>
<td>LLC TO EDD</td>
<td>AR</td>
<td>AR</td>
<td></td>
</tr>
<tr>
<td>PAGE7-55-1</td>
<td>BAR STIRRUP ASSY &amp; LLC TO EDD (HVABC)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11ED03</td>
<td>EDD CONSTRUCTION - SECTION 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13495</td>
<td>EDD FUSE LINK - 20A &quot;K&quot;</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PAGE7-54-3</td>
<td>EDD TO TRF HV</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>SET250-15</td>
<td>BOLT ON TRANSFORMER TO POLE</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PAGE7-81-13</td>
<td>LV PHASE BRIDGE TRF TO 1PH ISOLATOR</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PAGE7-79-13</td>
<td>NEUTRAL BRIDGE TRF TO NEUTRAL BUS</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PAGE7-74-1</td>
<td>XARM &amp; 3x1ph 630A ISOLATORS &amp; N-BUS</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PAGE7-80-18</td>
<td>BRIDGES - TRF ISOL &amp; N-BUS TO 3PH ISOL</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PAGE7-81-13</td>
<td>LV PHASE BRIDGE TRF TO 1PH FUSE SWITCH</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-79-18</td>
<td>NEUTRAL BRIDGE TRF TO MAINS (OWI)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET57-1</td>
<td>LV 1PH 630A ISOLATOR TO X-ARM</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-80-13</td>
<td>LV PHASE BRIDGE 1PH ISOL SWITCH TO MAINS</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[Copper Cable Size Conversion]

- 35 sqmm: 19/1.53
- 50 sqmm: 19/1.78
- 95 sqmm: 37/1.78
- 120 sqmm: 37/2.03
- 185 sqmm: 37/2.52

200kVA - 200kVA HV OPEN WIRE, LVABC
11PT/200AAL - 200kVA HVABC, LVABC
11PT/200 - 200kVA HV OPEN WIRE, LV OPEN WIRE

200kVA HV OPEN WIRE, LVABC

2x100kVA CIRCUITS

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

200 kVA
3 PHASE 11 kV POLE TRANSFORMERS
SUPPLY TO LVABC AND OPEN WIRE - WOOD POLE

OHC 7 Index

APPD: 4920-A4-G
CLEE: 7
TECH STDS: AUTOCAD
DATE: 29-10-2007
SECT: 7
PAGE: 11
SHEET: 1 OF 1

energex

This drawing must not be reproduced in part or whole without written permission from ENERGEX.
200 kVA - Bridging to LVABC Mains - 2x100 kVA Circuits

200 kVA - Bridging to Open Mains (3φ)
### Material List

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>DESCRIPTION</th>
<th>QTY</th>
<th>QTY</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAGE7-53-</td>
<td>LLC TO EOD</td>
<td>AR</td>
<td>AR</td>
<td></td>
</tr>
<tr>
<td>PAGE7-55-1</td>
<td>BAR STIRRUP ASSY &amp; LLC TO EOD (HVABC)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11ED03</td>
<td>EOD CONSTRUCTION - SECTION 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13730</td>
<td>EOD FUSE LINK - 25A &quot;K&quot;</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PAGE7-54-3</td>
<td>EDD TO TRF HV</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>SET250-15</td>
<td>BOLT ON TRANSFORMER TO POLE</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PAGE7-81-14</td>
<td>LV PHASE BRIDGE TRF TO 1PH ISOL</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PAGE7-79-14</td>
<td>NEUTRAL BRIDGE TRF TO NEUTRAL BUS</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PAGE7-74-1</td>
<td>XARM &amp; 3x1Ph 630A ISOLATORS &amp; N-BUS</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PAGE7-80-19</td>
<td>BRIDGES - TRF ISOL &amp; N-BUS TO 3PH ISOLS</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PAGE7-81-14</td>
<td>LV PHASE BRIDGE TRF TO 1PH FUSE SWITCH</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-79-19</td>
<td>NEUTRAL BRIDGE TRF TO MAINS (DWI)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET57-1</td>
<td>LV 1PH 630A ISOLATOR TO X-ARM</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE7-80-14</td>
<td>LV PHASE BRIDGE FUSE SWITCH-MAINS</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**11PT/315WA** - 315kVA HV OPEN WIRE, LVABC

**11PT/315AAL** - 315kVA HVABC, LVABC

**11PT/315** - 315kVA HV OPEN WIRE, LV OPEN WIRE

---

**Overhead Construction Manual**

**POLE MOUNTED PLANT**

**315 kVA**

3 PHASE 11 kV POLE TRANSFORMERS

**SUPPLY TO LVABC AND OPEN WIRE - WOOD POLE**

---

**Copper Cable Size Conversion**

- 35 sqmm: 19/153
- 50 sqmm: 19/178
- 95 sqmm: 37/178
- 120 sqmm: 37/203
- 185 sqmm: 37/252

---

**Energex**

© COPYRIGHT 2018 ENERGEX

This drawing must not be reproduced in part or whole without written permission from ENERGEX.
Note: Transformers are supplied with surge arresters fitted and wired. Actual arrangement may vary slightly to drawing.

315kVA - BRIDGING TO LVABC MAINS - 3x100kVA CIRCUITS

315kVA - BRIDGING TO OPEN MAINS (3φ)
Note: Transformers are supplied with surge arresters fitted and wired. Actual arrangement may vary slightly to drawing.

**500kVA - BRIDGING TO LVABC MAINS - 4x100kVA CIRCUITS**

**OVERHEAD CONSTRUCTION MANUAL**

**POLE MOUNTED PLANT**

500 kVA
3 PHASE 11 kV POLE TRANSFORMERS
SUPPLY TO LVABC AND OPEN WIRE - WOOD POLE
PAGE 7-53-1 - LLC TO Cu MAIN

PAGE 7-53-2 - LLC TO Cu STIRRUP

PAGE 7-53-3 - LLC TO AI MAIN & STIRRUP

PAGE 7-53-4 - LLC TO AI STIRRUP
PAGE 7-54-1  - CONNECTOR TO Cu MAIN or STIRRUP

MATERIAL
STOCK CODE  QTY.
07159      1.5
15075      1

Cu MAIN or STIRRUP

CONNECTOR 15075

CABLE, 19/1.53 Cu 07159

To EDO

PAGE 7-54-2  - CONNECTOR TO Al MAIN or STIRRUP

MATERIAL
STOCK CODE  QTY.
07159      1.5
15568      1

Al MAIN or STIRRUP

CONNECTOR 15568

CABLE, 19/1.53 Cu 07159

To EDO

PAGE 7-54-3  - HV BUSHING

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT  OHC 7 Index
TRANSFORMER HV BRIDGING SETS (OPEN WIRE)

HV BUSHING
SUPPLIED COMPLETE WITH BOLTS, NUTS, WASHERS & CONNECTORS

HV SURGE ARRESTER
SUPPLIED COMPLETE WITH WILDLIFE HOOD, CABLE & LUGS
(SC. 20750 FOR REPLACEMENT ONLY)

SURGE ARRESTER CONNECTOR TINNED COPPER 2mm THK.
SIDE HOLE IS SLOTED.

From EDO
TUBING 16mm (03639)
ROD, 8mm Cu (01403)

SUPPLIED BY TRANSFORMER MANUFACTURER

Palm to Rod Connector
(SINGLE ROD TO FLAT; COPPER ALLOY SOLDERLESS; 11mm HOLE; SUPPLIED BY TRANSFORMER MANUFACTURER;
PATTERN STYLE TO BE AGREED BETWEEN MANUFACTURER AND ENERGEX. REFER DRAWING 141-A4).

16 sqmm 11kV PE INSULATED PVC SHEATHED UV STABILISED CABLE

©COPYRIGHT 2008 ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX

©COPYRIGHT 2008 ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX
## MATERIAL LIST - 11BP

<table>
<thead>
<tr>
<th>SET</th>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>11kV BRIDGING INSULATOR TO POLE</td>
<td>00614</td>
<td>NUT, M20</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>01046</td>
<td>WASHER, M20, RD</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>02601</td>
<td>NAIL PLATE</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>08521</td>
<td>WASHER, M20, SQ</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>10447</td>
<td>WASHER, M20, VOLUTE</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>16384</td>
<td>11kV POST INSULATOR</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>BOLT &amp; NUT, M20 x AR</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>16385</td>
<td>TRUNNION CLAMP Cu</td>
<td>AR</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>PG CLAMP (To suit bridging)</td>
<td>AR</td>
</tr>
<tr>
<td></td>
<td>01403</td>
<td>Cu ROD 8mm</td>
<td>AR</td>
</tr>
</tbody>
</table>

**PAGE7-53-4**

- LLC TO AI STIRRUP

**OR**

- LLC TO Cu STIRRUP

**PAGE7-53-2**

11BP - 11kV BRIDGING POST

---

*NOTE: Diagrams are not provided in the text.*
CU LIST

<table>
<thead>
<tr>
<th>CU</th>
<th>PAGE7-7A-1</th>
<th>PAGE7-7A-2</th>
<th>PAGE7-7A-3</th>
<th>PAGE7-7A-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET51-1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SET53-1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SET57-1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>SET57-2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PAGE7-80-6</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SET3-2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET58-2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21306 (xarm)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

XARM 21306
100x100x1500

SET57-1
630A ISOL TO X-ARM
OR
SET57-2
800A ISOL TO X-ARM
OR
SET3-2
630A FUSE SWITCH TO X-ARM
OR
SET58-2
800A FUSE SWITCH TO X-ARM

PAGE7-74-1
LV XARM, 630A ISOLATORS, & N-BUS

PAGE7-74-2
LV XARM, 800A ISOLATORS, & N-BUS

PAGE7-74-3
LV XARM, 630A FUSE SWITCHES, & N-BUS

PAGE7-74-4
LV XARM, 800A FUSE SWITCHES, & N-BUS

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT
25-500 KVA TRANSFORMERS
TRANSFORMER LV ISOLATION & NEUTRAL BUS SUPPLY TO LVABC - WOOD POLE
### Overhead Construction Manual

**Pole Mounted Plant**

**OHC 7 Index**

**Neutral Bridging from Transformer Neutral Bushing Palm**

#### TRF Neutral Palm Bridging to Neutral Bus - LVABC Network

<table>
<thead>
<tr>
<th>KVA</th>
<th>SC</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 &amp; 63kVA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CABLE 2x35sqmm 19/153 Cu</td>
<td>07159</td>
<td>4</td>
</tr>
<tr>
<td>LUGS 35sqmm 19/153 Cu</td>
<td>06257</td>
<td>4</td>
</tr>
</tbody>
</table>

#### TRF Neutral Palm Bridging to Mains Neutral - Open Wire Network

<table>
<thead>
<tr>
<th>KVA</th>
<th>SC</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 &amp; 63kVA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CABLE 1x35sqmm 19/153 Cu</td>
<td>07159</td>
<td>3</td>
</tr>
<tr>
<td>LUGS 35sqmm 19/153 Cu</td>
<td>06257</td>
<td>1</td>
</tr>
</tbody>
</table>

---

**Notes:**

- The diagram illustrates the neutral bridging setup for different kVA ratings.
- BOLT & NUT M12 x 50 S.S. supplied with trf.
- WASHER M12 RD S.S. supplied with trf.
- TO PHASE SURGE ARRESTER CABLE 19/178 supplied with trf.
- TO NEUTRAL BUS CABLE 2x35sqmm 19/1.53 Cu supplied with trf.
- LUGS 19/178 supplied with trf.
- TO MAINS NEUTRAL 2 CABLES ON 315 & 500kVA.

---

**Copyright Information:**

- Energex
- Overhead Construction Manual
- Pole Mounted Plant
- Neutral Bridging from Transformer Neutral Bushing Palm

---

**Technical Standards:**

- AUTOCAD
- 4920-A4 IF

---

**Date:**

- 02-12-92

---

**File:**

- Sheet 1 of 1
PAGE 7-80 - PHASE BRIDGING FROM FUSE-SWITCH TO OPEN WIRE MAINS

PAGE 7-80 - NEUTRAL BUS 25-500kVA (LVABC)

PAGE 7-80 - PHASE & NEUTRAL BRIDGING FROM TRF ISOLATORS & N-BUS TO LVABC MAINS/CIRCUIT ISOLATORS

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

PHASE BRIDGING AND NEUTRAL BUS BRIDGING FROM TRF ISOLATORS/FUSES TO MAINS NEUTRAL BUS TO CROSSARM (LVABC)

APP'D: KBALL
TECH STDS: AUTOCAD

OHC 7 Index

DATE: 02-12-92
SECT: 7
PAGE: 80

4920-A4

sheet 1 of 1
Note: Transformers are supplied with surge arresters fitted and wired. Actual arrangement may vary slightly to drawing.

PAGE 7-81- - TRF PHASE PALM TO ISOLATOR OR FUSE HOLDERS/FUSE SWITCH - OPEN WIRE AND LVABC NETWORK
NOTE
1. 11LBSRMP 7-402 FOR MORE DETAIL
2. 11kV U.G. POLE TERMINATION 4-28 FOR MORE DETAIL
3. UG CABLE ON OPPOSITE SIDE OF POLE TO SWITCH
CU LIST - LVFM LVFMA

| SET2-1  | 1 | 1 |
| SET265-1 | 1 | 1 |
| SET265-2A | 1 | 1 |
| 22110   | 1 | 1 |
| 24208   | 3 | 3 |
| 21086   | 3 | 3 |
| 22313   | 3 | 3 |

**Notes:**

1. Voltage cable supplied with Monitor Box.
2. Bracket to be connected to LV earth - refer to drawings 3-251 and 3-252 for earthing
3. If Voltage monitor is used on poles with existing HV plant, refer to drawings 7-601 and 7-602 for earthing
4. Refer to Work Practice WP1007 for installation & commissioning procedures
5. Bracket - refer to drawing 1-265

**VOLTAGE LEAD PHASE**

1 Rib -------- A
2 Rib -------- B
3 Rib -------- C
Fully Ribbed = Neutral

**OVERHEAD CONSTRUCTION MANUAL**

**POLE MOUNTED PLANT OHC 7 Index**

LVFM, LVFMA
LOW VOLTAGE FEEDER MONITOR (WOOD POLE)
### MATERIAL LIST - MDIW

<table>
<thead>
<tr>
<th>SET</th>
<th>I.I.No.</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-4</td>
<td>00684</td>
<td>COACHSCREW, M12 x 90</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>05055</td>
<td>BRACKET, MOUNTING MDI</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>05063</td>
<td>INDICATOR, MAXIMUM DEMAND</td>
<td>1</td>
</tr>
</tbody>
</table>

### WIRING CONNECTION TO C.T.

<table>
<thead>
<tr>
<th>I.I.No.</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>04574</td>
<td>CT, 800/300/200/5</td>
<td>3</td>
</tr>
<tr>
<td>04691</td>
<td>CABLE, GLAND</td>
<td>1</td>
</tr>
<tr>
<td>04927</td>
<td>SADDLE, CONDUIT, 16mm</td>
<td>5</td>
</tr>
<tr>
<td>06271</td>
<td>TERMINAL LUG, 2.5mm²</td>
<td>10</td>
</tr>
<tr>
<td>06486</td>
<td>CABLE TIES</td>
<td>AR</td>
</tr>
<tr>
<td>07111</td>
<td>CABLE, 2.5mm² 4c</td>
<td>8</td>
</tr>
<tr>
<td>09867</td>
<td>TERMINAL LUG, 2.5mm²</td>
<td>4</td>
</tr>
<tr>
<td>10490</td>
<td>SPIRAL WRAP TUBING</td>
<td>2</td>
</tr>
<tr>
<td>11430</td>
<td>NAIL, 30mm LONG</td>
<td>AR</td>
</tr>
</tbody>
</table>

### NOTES:

1. In the CT Connection of the following transformer sizes, one is made the common connection and the other the active connection.

   - 63kVA  - S2,S3 = 100/5 Ratio
   - 100kVA - S1,S2 = 200/5 Ratio
   - 200kVA - S1,S3 = 300/5 Ratio
   - 315kVA - S3,S4 = 500/5 Ratio
   - 500kVA - S1,S4 = 800/5 Ratio

---

**CONNECTION FOR 315kVA TRANSFORMER SHOWN (NOTE 1)**

**WIRING SCHEMATIC**

**TERMINAL CONNECTIONS**

1 & 2 - NORMAL BRIDGE
2 - COMMON (BLACK)
3 - 'a' PHASE (RED)
4 - 'b' PHASE (WHITE)
5 - 'c' PHASE (BLUE)
**IMPORTANT NOTE:**

1. ENSURE Voltage Leads are connected so that it is on the SAME phase that the CT is measuring. 
   (REGARDLESS of phase configuration)

   **VOLTAGE LEAD | CT LEAD | LV BUSHING**
   1. Rb --------> RED --------> U or A
   2. Rb --------> WHITE --------> V or B
   3. Rb --------> BLUE --------> W or C

2. Fully Ribbed = Neutral

3. Refer To 7-93 for Construction Details

4. Refer to Work Practice WP1007 for installation & commissioning procedures

5. DWG 26806-A3 for Monitor Box details

---

**OVERHEAD CONSTRUCTION MANUAL**

**POLE MOUNTED PLANT**

**LV TRANSFORMER MONITOR**

**CT WIRING ARRANGEMENT**

**SINGLE BOX VERSION (2017)**

---

**NOTE:** This drawing must not be reproduced in part or whole without written permission from ENERGEX.
### PT STATION MONITOR CU LIST

<table>
<thead>
<tr>
<th>NEW PT</th>
<th>RETROFIT PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Sizes</td>
<td>25-63kVA</td>
</tr>
<tr>
<td>Wood Pole</td>
<td>PTSMNW500</td>
</tr>
<tr>
<td>Concrete Pole</td>
<td>PTSMNC500</td>
</tr>
</tbody>
</table>

### DETAIL CU LIST

<table>
<thead>
<tr>
<th>New Wood</th>
<th>New Concr</th>
<th>Wood Retrofit</th>
<th>Concrete Retrofit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSMNW500</td>
<td>PTSMNW500</td>
<td>PTSMRW63</td>
<td>PTSMRW200</td>
</tr>
<tr>
<td>PTSMNC500</td>
<td>PTSMNC500</td>
<td>PTSMRC63</td>
<td>PTSMRC200</td>
</tr>
</tbody>
</table>

#### Bracket

<table>
<thead>
<tr>
<th>SET94-1</th>
<th>SET94-1</th>
<th>SET94-1</th>
<th>SET94-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET265-1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SET265-1C</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SET265-2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Pole accessories

<table>
<thead>
<tr>
<th>SET94-1</th>
<th>SET94-1</th>
<th>SET94-1</th>
<th>SET94-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>04930</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>23001</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>08540</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>06270</td>
<td>AR</td>
<td>AR</td>
<td>AR</td>
</tr>
<tr>
<td>06486</td>
<td>AR</td>
<td>AR</td>
<td>AR</td>
</tr>
<tr>
<td>11430</td>
<td>AR</td>
<td>AR</td>
<td>AR</td>
</tr>
<tr>
<td>20707</td>
<td>AR</td>
<td>AR</td>
<td>AR</td>
</tr>
</tbody>
</table>

### Monitor Kits

<table>
<thead>
<tr>
<th>SET94-1</th>
<th>SET94-1</th>
<th>SET94-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>23344</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>22995</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>22996</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

---

**SET94-1** required on all types

**SET2-1**
- SET2-1
- 00184
- 01044

**SC FOR INDIVIDUAL CT ONLY**
- 23015 100/5 45mm Hole - suits 25-63kVA
- 21716 800/5 45mm Hole - suits 100kVA Wilson
- 23014 800/5 60mm Hole - suits 100-315kVA
- 23016 800/5 90mm Hole - suits 500kVA

---

**OVERHEAD CONSTRUCTION MANUAL**

**POLE MOUNTED PLANT**

**PTSM**

**PT STATION MONITOR 2013 CU LIST**

---

© COPYRIGHT 2016 ENERGEX

This drawing must not be reproduced in part or whole without written permission from ENERGEX
MOUNT FUSES TO POLE AS NEAR AS POSSIBLE TO UNDERSIDE OF CROSSARM TO SUIT SPACE AND OPERATIONAL REQUIREMENTS

SET2-1 3 PH SERVICE FUSE BRACKET
FUSE BASE & CARRIER 21086
FUSE 20A 22313

MOUNT MONITOR BOX AWAY FROM TRAFFIC SIDE OF POLE AS SPACE PERMITS

TOP OF MONITOR BRACKET AT LEAST 1.5m BELOW X-ARM TO ALLOW FOR SAFE ACCESS TO LV AND FUTURE BROADBAND CABLE.

MONITOR BOX SUPPLIED WITH EARTH LEADS TO BE CUT TO REQUIRED LENGTH AND LUGGED TO BRACKET EARTH (NOTE 6)

NOTES:
1. CT, CT Cable & Conduits supplied with monitor box.
2. Timber poles - refer to drawings 7-601 and 7-602 for earthing
3. Concrete poles - refer to drawings 7-619 and 7-620 for earthing
4. CT wiring - refer to drawing 7-92
5. CU's - refer to drawing 7-93
6. Bracket - refer to drawing 1-265

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT
PTSM
PT STATION MONITOR 2013

SADDLE 32mm
04930
STRAP & BUCKLE
12061 and 12060
NAILS or SCREWS
11430 or 20701

CABLE 2xC3
07208 (NOTE 1)
32mm CORRUGATED CONDUIT
22447 (NOTE 1)

OPTIMAL ANTENNA
SET265-2A
LV MONITOR BOX
23364 25-63 kVA
22995 100-315 kVA
22996 500kVA

Voltage Cable 16sqmm Cu
Min 1.5m

Voltage Cable (NOTE 1)
6sqmm Cu 4C in 25mm corrugated conduit
22110

SET265-1C OR SET265-1
BRACKET TO POLE

Earthing (NOTES 2 & 3)
Any excess cable to be coiled in 300 mm loops & secured to mounting bracket

3.0m min. to ground
CU LIST - 11LBSPTFF

SP - 256
22437 1
22438 1
00411 1
01053 1
01081 1
22559 2
PG Clamps AR

Surge Arresters (supplied)

PG CLAMPS to suit mains Refer Sect 8

Insulated Copper Bridging (supplied) 125 sqmm Cu

Rear Pointer

Set256-1

LOAD BREAK SWITCH

Earth Connection
(Actual fitment is to RHS side of switch)

BOLT & NUT M12x30
00411
WASHER M12 RD
01053
WASHER M12 LOCK
01081

Remove "J" Bolts & Straps and return to local depot store.

22437

WILDLIFE GUARD

Install each side of switch on middle phase insulator/s to manufacturer's instructions

Mass of switch (fully fitted): 103 kg
Mass of bracket: 30 kg
Max Load Break: 630A @ 0.7 pf
APPROVED ISOLATION POINT

Pole Earth Downlead 19/1.78 Cu PVC

Connecting rod guide (Install 1/2 way between switch & actuator)

INSTALL ACTUATOR TO ALLOW SAFE OPERATION FROM FOOTPATH

ACTUATOR POSITIONS

"Green"

Pre-fitted switch earth downlead.
(Actual fitment is to RHS side of bracket)

Connect pole downlead to switch earth downlead
(Remove/replace ex nut and washers for connection)

Actuator connecting rod (insulated)
Supplied as 5m length
(Cut rod to desired length if required)

Refer SET256-1 for connection diagram

22438 REMOTE ACTUATOR + 5m ROD

Link stick operated
Refer installation instructions
Min. mounting height 4m

"Green"

SHEET 1 OF 1

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT OHC 7 Index

11LBSPTFF

11kV MANUALLY OPERATED LOAD BREAK SWITCH
POLE TOP MOUNTED - NGK FULLY FITTED

RECEIVED
JOHN TUNNEY

DATE 11-08-2011

SHEET 1 OF 1

Copyright 2011 ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX

DATE 25-9-2011

APPROVED
NO
DRAWN
JOHN TUNNEY

APPROVED REVISION DATE

RECEIVED

DRAWN
JOHN TUNNEY

11kV MANUALLY OPERATED LOAD BREAK SWITCH
POLE TOP MOUNTED - NGK FULLY FITTED

APPROVED

RECEIVED

DRAWN

COPYRIGHT 2011 ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX

DATE 25-9-2011

APPROVED
NO
DRAWN
JOHN TUNNEY

APPROVED REVISION DATE

RECEIVED

DRAWN
JOHN TUNNEY

COPYRIGHT 2011 ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX

DATE 25-9-2011

APPROVED
NO
DRAWN
JOHN TUNNEY

APPROVED REVISION DATE

RECEIVED

DRAWN
JOHN TUNNEY

COPYRIGHT 2011 ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX

DATE 25-9-2011

APPROVED
NO
DRAWN
JOHN TUNNEY

APPROVED REVISION DATE

RECEIVED

DRAWN
JOHN TUNNEY
SWITCH MAY BE FITTED TO FOOTPATH OR ROAD SIDE TO SUIT SITE AND OPERATOR REQUIREMENTS

Mid pole actuator mechanism is included with material issue for this construction but should only be used if switch is mounted beyond reach of link stick. Unused actuator mechanisms must be returned to store.

Mid pole actuator: sc 22438

Mass of Switch (fully fitted): 103 kg
Mass of Bracket: 18 kg
Max Load Break: 630A @ 0.7 pf

APPROVED ISOLATION POINT

Earth Connection (Bolt & nut supplied)

INSTALL ACTUATOR TO "Green" - LOAD BREAK SWITCH

CMEN area connection if available

Connecting rod guide (install 1/2 way between switch and actuator)

REMOTE ACTUATOR + 5m ROD
Link stick operated
Refer installation instructions
Min. mounting height 4m

Actuator may be mounted up to 90 degrees in either direction around pole provided rod does not interfere with other pole equipment or hardware and switch can be operated freely.

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

11LBSMPFF

11kV MANUALLY OPERATED LOAD BREAK SWITCH

MID POLE MOUNTED - NGK FULLY FITTED

©COPYRIGHT 2011 ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX

©COPYRIGHT 2011 ENERGEX

©COPYRIGHT 2011 ENERGEX
OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

11LBSPT

11kV MANUALLY OPERATED LOAD BREAK SWITCH
POLE TOP MOUNTED - NGK

CU LIST -

| SET270-3 | 1 |
| SET272-2 | 1 |
| 19920 | 1 |
| 20279 | 12m |
| 19938 | 1 |
| 00412 | 6 |
| 01081 | 6 |
| 09945 | 6 |
| 05893 | 6 |
| 00190 | 1 |

Normal fitment is switch to footpath side

Switch may be fitted to footpath or road side to suit site and operator requirements.

Earthing (not included in 11LBSPT)

HVE: Separate earth system (see page 605)
HVEC: Common earth system (see page 605)

Mass of switch: 75 kg
Mass of bracket: 35 kg
Max Load Break: 630A @ 0.7 pf
Approved isolation point

Earthing connector

Earth connector

Earth downlead 19/178 Cu PVC

Eyebolt hole for lifting bracket to pole

Paint mark on top surface of bracket indicates where inside "U" bolt sits.

Earth lead 19/178 Cu PVC

SET270-3
POLE TOP MOUNTING BKT
00190
SAFETY BOLT & NUT M12x100

19920
LOAD BREAK SWITCH

00412
BOLT & NUT M12x40
0081
LOCK WASHER M12
09945
TERMINAL LUG 120 sqmm

19938
MID POLE ACTUATOR + 6m ROD
Link stick operated
Refer installation instructions
Min. mounting height 4m

Actuator may be mounted up to 90 degrees in either direction around pole provided rod does not interfere with other pole equipment or hardware.

Connecting rod guide
(install 1/2 way between switch & actuator)

Connecting rod guide

ACTUATOR POSITIONS

INSTALL ACTUATOR TO ALLOW SAFE OPERATION FROM FOOTPATH

ACTUATOR POSITIONS

ACTUATOR POSITIONS

120 sqmm

Terminal lug

Overhead construction manual

©COPYRIGHT 2010 ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX

APP'D RENGISH
DATE 30-01-2008
RECD J.TUNNEY
DATE 06-04-2010
TECH STDS AUTO CAD

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT

11LBSPT

11kV MANUALLY OPERATED LOAD BREAK SWITCH
POLE TOP MOUNTED - NGK
CU LIST -

<table>
<thead>
<tr>
<th>SET</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET270-4</td>
<td>1</td>
</tr>
<tr>
<td>SET272-2</td>
<td>1</td>
</tr>
<tr>
<td>19920</td>
<td>12m</td>
</tr>
<tr>
<td>2900</td>
<td>1</td>
</tr>
<tr>
<td>00412</td>
<td>6</td>
</tr>
<tr>
<td>01081</td>
<td>6</td>
</tr>
<tr>
<td>09945</td>
<td>6</td>
</tr>
<tr>
<td>05893</td>
<td>6</td>
</tr>
<tr>
<td>00190</td>
<td>1</td>
</tr>
</tbody>
</table>

Paint mark on top surface of bracket indicates where inside "U" bolt sits.

Mid pole actuator mechanism is included with material issue for this construction but should only be used if switch is mounted beyond reach of link stick. Unused actuator mechanisms must be returned to store. Mid pole actuator: sc 21269

Mass of Switch : 75 kg
Mass of Bracket : 18 kg
Max Load Break : 630A @ 0.7 pf
APPROVED ISOLATION POINT

Earthing (not included in 11LBSMP)

HVE : SEPARATE EARTH SYSTEM (SEE PAGE 605)
HVEC : COMMON EARTH SYSTEM (SEE PAGE 605)

INSTALL ACTUATOR TO ALLOW SAFE OPERATION FROM FOOTPATH

Earthing (not included in 11LBSMP)

HVE : SEPARATE EARTH SYSTEM (SEE PAGE 605)
HVEC : COMMON EARTH SYSTEM (SEE PAGE 605)

Connecting rod guide (Install 1/2 way between switch and actuator)

MID POLE ACTUATOR + 4m ROD
Link stick operated
Refer installation instructions
Min. mounting height 4m
Actuator may be mounted up to 90 degrees in either direction around pole provided rod does not interfere with other pole equipment or hardware.

Approved isolation point

INSTALL ACTUATOR TO ALLOW SAFE OPERATION FROM FOOTPATH

Paint mark on top surface of bracket indicates where inside "U" bolt sits.

Mid pole actuator mechanism is included with material issue for this construction but should only be used if switch is mounted beyond reach of link stick. Unused actuator mechanisms must be returned to store. Mid pole actuator: sc 21269

Mass of Switch : 75 kg
Mass of Bracket : 18 kg
Max Load Break : 630A @ 0.7 pf
APPROVED ISOLATION POINT

Earthing (not included in 11LBSMP)

HVE : SEPARATE EARTH SYSTEM (SEE PAGE 605)
HVEC : COMMON EARTH SYSTEM (SEE PAGE 605)

Connecting rod guide (Install 1/2 way between switch and actuator)

MID POLE ACTUATOR + 4m ROD
Link stick operated
Refer installation instructions
Min. mounting height 4m
Actuator may be mounted up to 90 degrees in either direction around pole provided rod does not interfere with other pole equipment or hardware.

Approved isolation point

INSTALL ACTUATOR TO ALLOW SAFE OPERATION FROM FOOTPATH

Paint mark on top surface of bracket indicates where inside "U" bolt sits.

Mid pole actuator mechanism is included with material issue for this construction but should only be used if switch is mounted beyond reach of link stick. Unused actuator mechanisms must be returned to store. Mid pole actuator: sc 21269

Mass of Switch : 75 kg
Mass of Bracket : 18 kg
Max Load Break : 630A @ 0.7 pf
APPROVED ISOLATION POINT

Earthing (not included in 11LBSMP)

HVE : SEPARATE EARTH SYSTEM (SEE PAGE 605)
HVEC : COMMON EARTH SYSTEM (SEE PAGE 605)

Connecting rod guide (Install 1/2 way between switch and actuator)

MID POLE ACTUATOR + 4m ROD
Link stick operated
Refer installation instructions
Min. mounting height 4m
Actuator may be mounted up to 90 degrees in either direction around pole provided rod does not interfere with other pole equipment or hardware.

Approved isolation point

INSTALL ACTUATOR TO ALLOW SAFE OPERATION FROM FOOTPATH

Paint mark on top surface of bracket indicates where inside "U" bolt sits.

Mid pole actuator mechanism is included with material issue for this construction but should only be used if switch is mounted beyond reach of link stick. Unused actuator mechanisms must be returned to store. Mid pole actuator: sc 21269

Mass of Switch : 75 kg
Mass of Bracket : 18 kg
Max Load Break : 630A @ 0.7 pf
APPROVED ISOLATION POINT

Earthing (not included in 11LBSMP)

HVE : SEPARATE EARTH SYSTEM (SEE PAGE 605)
HVEC : COMMON EARTH SYSTEM (SEE PAGE 605)

Connecting rod guide (Install 1/2 way between switch and actuator)
Mass of switch (fully fitted): 118 kg
Mass of bracket: 28 kg
Max Load Break: 630A @ 0.7 pf

APPROVED ISOLATION POINT
WHEN ACTUATOR IS ATTACHED
INSTALL ACTUATOR TO ALLOW SAFE OPERATION FROM FOOTPATH

ACTUATOR POSITIONS

EARTHING (NOT INCLUDED IN 11LBSPTFFIS)
HVE: SEPARATE EARTH SYSTEM (SEE PAGE 605)
HVEC: COMMON EARTH SYSTEM (SEE PAGE 605)

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT
11LBSPTFFIS
11kV MANUALLY OPERATED LOAD BREAK SWITCH
POLE TOP MOUNTED - ILJIN FULLY FITTED
CU LIST - 11LBSMPFFS

SET266-2  1
23483  1
23484  1

PG Clamps AR

SWITCH MAY BE FITTED TO FOOTPATH OR ROAD SIDE TO SUIT SITE AND OPERATOR REQUIREMENTS

Mid pole actuator mechanism is included with material issue for this construction.

Actuator must be installed with LBS
To retrofit actuator to existing Ljgin LBS use SC 234.84

Mass of Switch (fully fitted): 118 kg
Mass of Bracket : 18 kg
Max Load Break : 630A @ 0.7 pf
APPROVED ISOLATION POINT WHEN ACTUATOR IS ATTACHED

EARTHING (NOT INCLUDED IN 11LBSMPFFS)
HVE : SEPARATE EARTH SYSTEM (SEE PAGE 605)
HVEC : COMMON EARTH SYSTEM (SEE PAGE 605)

INSTALL ACTUATOR TO ALLOW SAFE OPERATION FROM FOOTPATH

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT
11kV MANUALLY OPERATED LOAD BREAK SWITCH
MID POLE MOUNTED - ILJIN FULLY FITTED

SAFETY BOLT & NUT M12x100
Surge Arresters (supplied)
SET266-2
SWITCH TO BRACKET TO POLE (Includes actuator coupling)

Insulated Aluminium Bridging (supplied) (120 sqmm Al)
Paint mark on top surface of bracket indicates where inside "J" bolt & strap sits.

Eye bolt hole for fixing bracket to pole
900

Keep earth electrode clear of operating mechanism

Earth Downlead 19/1.78 Cu PVC

Actuator connecting rod
Supplied as 5m length
(Rod may be cut to desired length)
Refer SET256-2 for connection diagram

2550

CMEN area connection if available

Connecting rod guide (if required)
(Install 1/2 way between switch and actuator)

REMOTE ACTUATOR + 5m ROD
Link stick operated
Refer installation instructions
Min. mounting height 4m

Actuator may be mounted up to 90 degrees in either direction around pole provided rod does not interfere with other pole equipment or hardware and switch can be operated freely.
CU LIST -

11ABSUMLP

SET258-4  1
23835      1
00690      2

DETAIL A
TOP UNIVERSAL

BOTTOM UNIVERSAL
AL PIPE
PE INSULATED

BOTTOM GUIDE
COUPLING

DETAIL B

TOP GUIDE

ALUMINIUM EXTENSIBLE DOWNROD

EARTHING BRAIDS
CONNECT BETWEEN DOWNROD
COUPLING, BRACKET & HANDLE

COUPLING

00690
COACH SCREWS
M16 x 130

1200

NOTE:
1 MEASURE POLE TOP DIAMETER
AND ADJUST BRACE ACCORDINGLY

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT
11ABSUMLP
11kV AIR BREAK SWITCH - MID or TOP MOUNTING
WOOD POLE - PLP

Mass of Switch : 70 kg
Mass of Bracket : 25 kg
Max Load Break : 150A @ 0.7 pf
APPROVED ISOLATION POINT

DATE 02-12-92
REVD

APP'D KEVIN BALL

TECH STDS AUTOCAD
4920-A4 G

ORIG ISSUE 3/90/90

ERNEST R. THOMAS
.Db.

© COPYRIGHT 20% ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX

PAGE 7 OF 101

101

M. Welsh

DWN

OKE

SECT 7
NOTE:
1. MEASURE POLE TOP DIAMETER
AND ADJUST BRACE ACCORDINGLY

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT
33ABSUMPLP
33kV AIR BREAK SWITCH - MID or TOP MOUNTING
WOOD POLE - PLP

Mass of Switch: 76 kg
Mass of Bracket: 25 kg
Max Load Break: 150A @ 0.7 pf
APPROVED ISOLATION POINT

DETAIL A
TOP UNIVERSAL

DETAIL B
TOP GUIDE
BOTTOM UNIVERSAL
BOTTOM GUIDE
COUPLING

EARTHING BRACTS
CONNECT BETWEEN DOWNROD
COUPLING, BRACKET & HANDLE

CU LIST
SET258-4
23836
00690

AL PIPE
PE INSULATED
BOTTOM UNIVERSAL
TOP GUIDE
BOTTOM GUIDE
COUPLING
ALUMINIUM EXTENSIBLE DOWNROD
OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

11kV & 33kV UNITISED ABS - NGK
POLE TOP SWITCH OPERATING ROD ASSEMBLY

DETAIL A
TOP UNIVERSAL

DETAIL B
BOTTOM UNIVERSAL
TOP GUIDE
DETAIL C
BOTTOM GUIDE

EARTHING Braid
BOTTOM COUPLING
COACH SCREWS 00690
EARTHING

GALV. PIPE DOWN ROD
32mm NB (SUPPLIED BY ENERGEX)
02594

BOTTOM COUPLING
1200

TOP GUIDE
GALV. PIPE PE INSULATED

DRAWN: M. Welsh
SECT 7
REMARKS:

©COPYRIGHT 2008 ENERGEX
This drawing must not be reproduced in part or whole without written permission from ENERGEX.
NOTE
WHERE ABS IS
INSTALLED BELOW
SHACKLE CONSTN
ARC SUPPRESSORS
MUST BE FITTED

SET 257-3

OPEN WIRE BRIDGING—POLE TOP

HVABC BRIDGING—POLE TOP

HVABC TO OPEN WIRE BRIDGE — UNITISED

OPEN WIRE BRIDGING—MID POLE UNITISED

OPEN WIRE BRIDGING—MID POLE UNITISED

HVABC BRIDGING — MID POLE UNITISED
### MATERIAL

**STOCK CODE**

<table>
<thead>
<tr>
<th>LUG-AS REQ'D</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHER M12 RD S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHER M12 LOCK S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL, CET. OR CU. BRIDGE/MAINS TAIL</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL CONNECTOR BRACKET</td>
<td>( M12 \times 40 ) S.S.</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHER M12 RD S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHER M12 LOCK S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUG-AS REQ'D</td>
<td>1</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LASHER M12 RD S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHER M12 LOCK S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUG-AS REQ'D</td>
<td>1</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LASHER M12 RD S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHER M12 LOCK S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUG-AS REQ'D</td>
<td>1</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHER M12 RD S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHER M12 LOCK S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUG-AS REQ'D</td>
<td>1</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LASHER M12 RD S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHER M12 LOCK S.S.</td>
<td>supplied with switch</td>
</tr>
</tbody>
</table>

**STOCK CODE**

<table>
<thead>
<tr>
<th></th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUG-AS REQ'D</td>
<td>1</td>
</tr>
</tbody>
</table>

---

**PAGE 7-145-1** OPEN WIRE TO ABS PALM

**PAGE 7-145-2** CONNECTOR TO SURGE ARRESTER TAIL

**PAGE 7-145-3** HVABC TO CONNECTOR BRACKET & PALM

**PAGE 7-145-4** HVABC TO ABS PALM

---

**OVERHEAD CONSTRUCTION MANUAL**

**POLE MOUNTED PLANT**

**OHC 7 Index**

**AIR BREAK SWITCH HV BRIDGING SETS**

**COPYRIGHT 2008 ENERGEX**

This drawing must not be reproduced in part or whole without written permission from ENERGEX.
### CU LIST - 1REC/NOJA

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>1REC/NOJA</th>
<th>1REC/NOJA</th>
<th>15SY/N/NOAFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET465-1</td>
<td>ISOLATOR SWITCH</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>SET254-1</td>
<td>EDO FUSE SWITCH</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SET151-1</td>
<td>X-ARM TO POLE</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SET55-2</td>
<td>POST TO X-ARM</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>SET257-2</td>
<td>RECLOSER TO POLE</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SET271-3A</td>
<td>ARRESTER TO TANK</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET274-1</td>
<td>VT TO POLE</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET260-1</td>
<td>C/BOX BKT TO POLE</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET274-2</td>
<td>ANTENNA TO XARM</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET52-1</td>
<td>BRACE TO POLE</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08368</td>
<td>(Tape)</td>
<td>AR</td>
<td>AR</td>
<td>AR</td>
</tr>
<tr>
<td>14493</td>
<td>(Arrester PG clamps)</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21058</td>
<td>Recloser, VT, CONTROL BOX</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23606</td>
<td>Recloser FF, VT, CONTROL BOX</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2469773</td>
<td>Synchrophaser, VT, CONTROL BOX</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mains PG CONNECTORS</td>
<td>AR</td>
<td>AR</td>
<td>AR</td>
<td></td>
</tr>
<tr>
<td>20279</td>
<td>CCT 120sqmm</td>
<td>15m</td>
<td>6m</td>
<td>6m</td>
</tr>
<tr>
<td>17799</td>
<td>Polymeric Side Tie</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>11067</td>
<td>xarm 3m 100x100mm</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>13401</td>
<td>EDO Fuses 3A-K</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

### NOTES
1. Maintain minimum separation of 150mm between earthing cables and any other equipment cables.
2. Ensure wildlife proofing insulated hoods (supplied with recloser and VTI installed over all bushings and surge arresters).
3. 1REC/NOJA/1AFF comes fully fitted with surge arresters and leads from factory.
4. Refer OCM sect 7 page 606,607 for equipment earthing detail.
5. For older style tunnel connections use torque wrench with 8mm allen key @ 30N-m for HV connections to switch.
6. VT secondary cable supplied with VT. Cover the entire length of the secondary cable with 25mm conduit from VT and terminating at the control box.

### HV SCHEMATIC

25mm conduit from VT and terminating at the control box.
7. Stock code for replacement VT secondary
   - RC10 - 2A HRC fuse is SC 19537.
   - RC20 - 6A HRC fuse is SC 24,00578.
9. In areas where CCT mains exist, strip small section of CCT near top xarm on each phase to allow for phasing out.
10. Control Box to be mounted for access from footpath side of pole or as determined on site in difficult terrain.
11. Construction limited to 400A. Switch rated at 800A.
12. 15SY/N/NOAFF IRC20 (Controller) has a second antenna attached to the control box bracket. The replacement stockcode for the second antenna is SC61703

### OVERHEAD CONSTRUCTION MANUAL

**POLE MOUNTED PLANT**

**OHC 7 Index**

**11REC/NOJA, 11REC/NOJA**

**11kV 400A REMOTE CONTROLLED RECLOSER CONSTRUCTION - NOJA**
Earthing (not included in 11REC/NOJA, 11REC/NOJAFF)
HVE2: CMEN system (see page 607)
HVE1: SEPERATE EARTH SYSTEM (see page 606)

11kV Shackel construction
20279 120 sqmm CCT
SET151-1 X-Arm to pole
40 sqmm CCT (supplied with VT)
SET274-1 VT to pole
TOP VT K bolt is same as recloser bottom bolt

Source
Set 274-2 Antenna to XArm
Load
Set 155-2 Post to XArm
17799 Polymeric Side Ties
Set 257-2 Recloser to pole
Control cable
Min. Bend Radius = 150mm
Note 1

Notes 1 & 4

Overhead Construction Manual
11REC/NOJA, 11REC/NOJAFF
11kV 400A remote controlled recloser construction - NOJA
### MATERIAL LIST - 33REC/630

<table>
<thead>
<tr>
<th>DESC.</th>
<th>SC/CU</th>
<th>QTY</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>33kV X-ARM</td>
<td>NOT INCLUDED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISOLATION LINKS &amp; X-ARM</td>
<td>SET152-1</td>
<td>1</td>
<td>BRACE (650) TO X-ARM</td>
</tr>
<tr>
<td></td>
<td>SET151-1</td>
<td>1</td>
<td>X-ARM TO POLE</td>
</tr>
<tr>
<td></td>
<td>11067</td>
<td>1</td>
<td>3000X100X100 X-ARM</td>
</tr>
<tr>
<td></td>
<td>21720</td>
<td>3</td>
<td>33kV 630A LINKS</td>
</tr>
<tr>
<td>EQUIPT. TO POLE FASTENERS</td>
<td>00243</td>
<td>5</td>
<td>200mm M20 NUTS &amp; BOLTS</td>
</tr>
<tr>
<td></td>
<td>08521</td>
<td>5</td>
<td>M20 FLAT WASHERS</td>
</tr>
<tr>
<td></td>
<td>10447</td>
<td>5</td>
<td>M20 VOLUTE</td>
</tr>
<tr>
<td></td>
<td>01046</td>
<td>5</td>
<td>M20 WASHER</td>
</tr>
<tr>
<td>EDO'S</td>
<td>15621</td>
<td>1</td>
<td>33kV EDO'S</td>
</tr>
<tr>
<td></td>
<td>13401</td>
<td>1</td>
<td>33kV EDO FUSE 3A-&quot;K&quot;</td>
</tr>
<tr>
<td>RECLOSER VT, &amp; CONTROL BOX</td>
<td>SET257-2</td>
<td>1</td>
<td>RECLOSER TO POLE</td>
</tr>
<tr>
<td></td>
<td>SET260-1</td>
<td>1</td>
<td>CONTROL BOX TO POLE</td>
</tr>
<tr>
<td></td>
<td>SET271-4</td>
<td>6</td>
<td>33kV SURGE ARRESTER TO TANK</td>
</tr>
<tr>
<td></td>
<td>SET274-1</td>
<td>1</td>
<td>VT TO POLE</td>
</tr>
<tr>
<td></td>
<td>21060</td>
<td>1</td>
<td>RECLOSER, VT, &amp; CONTROL BOX</td>
</tr>
<tr>
<td></td>
<td>SET274-2</td>
<td>1</td>
<td>ANTENNA TO X-ARM</td>
</tr>
<tr>
<td>BRIDGING</td>
<td>55507</td>
<td>7</td>
<td>AI 240sq.mm LUGS</td>
</tr>
<tr>
<td></td>
<td>16015</td>
<td>3</td>
<td>33kV LINE POST INSULATOR</td>
</tr>
<tr>
<td></td>
<td>17631</td>
<td>4</td>
<td>BI-METAL LUGS</td>
</tr>
<tr>
<td></td>
<td>SET154-3</td>
<td>3</td>
<td>33kV BRIDGING POST TO X-ARM</td>
</tr>
<tr>
<td></td>
<td>07328</td>
<td>6m</td>
<td>PLUTO</td>
</tr>
<tr>
<td></td>
<td>PAGE7-145-1</td>
<td>10</td>
<td>BRIDGE TO LINKS/EDO'S</td>
</tr>
<tr>
<td></td>
<td>05909</td>
<td>6</td>
<td>BRIDGE TO ARRESTERS</td>
</tr>
<tr>
<td></td>
<td>PG CLAMPS</td>
<td>A.R</td>
<td>BRIDGING TO MAINS</td>
</tr>
</tbody>
</table>

### TYPICAL NETWORK ARRANGEMENTS

**LEGEND**
- 33kV RECLOSER
- 33kV ISOLATION LINKS
- 33kV CIRCUIT BREAKER

**NOTE:** ISOLATION SIDE & NON-ISOLATION SIDE MUST BE SPECIFIED ON WORKS PLAN FOR EACH RECLOSER SITE

---

### OVERHEAD CONSTRUCTION MANUAL

**POLE MOUNTED PLANT**

**33REC/630**

**33kV SCHNEIDER "N" SERIES RECLOSER**

**MATERIAL LIST**
OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

33REC/630

33KV SCHNEIDER "N" SERIES RECIORDER CONSTRUCTION

NOTES:
1. Maintain minimum separation of 150mm between earthing cables and any other equipment cables.
2. Install wildlife proofing insulating hoods over all bushings & surge arresters.
3. Refer OCM sect 7 page 606,607 for equipment earthing detail.
4. VT LV terminal supplied complete with HRC secondary fuses.
6. Stock code for VT secondary fuseholder is 20285.
   Stock code for VT secondary fuse (3.15A type T1) is 20284.
1. Maintain minimum separation of 150mm between earthing cables and any other equipment cables.
2. Ensure wildlife proofing insulating hoods installed over all bushings & surge arresters.
3. Refer OCM sect 7 page 606, 607 for equipment earthing detail.
4. VT LV terminal supplied complete with HRC secondary fuses.
5. VT Secondary cable supplied with VT. Cover the entire length of secondary cable with 25mm conduit from VT and terminating at the control box.
6. Stock code for VT secondary 2A HRC fuse is 19537
   Mass of fully fitted recloser: 176 kg.
8. 33REC/NOJAFF comes fully fitted with surge arresters and leads from factory.
9. Construction limited to 630A. Switch rated at 800A.
<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET174-2</td>
<td>ANTENNA TO X-ARM</td>
<td>1</td>
</tr>
<tr>
<td>SET175-1</td>
<td>EDO FUSE SWITCH</td>
<td>1</td>
</tr>
<tr>
<td>13401</td>
<td>EDO FUSE LINK - 3A &quot;K&quot;</td>
<td>1</td>
</tr>
<tr>
<td>SET175-2</td>
<td>POST INSULATOR TO X-ARM</td>
<td>6</td>
</tr>
<tr>
<td>20279</td>
<td>CCT 120 SQ MM</td>
<td>20</td>
</tr>
<tr>
<td>17799</td>
<td>POLYMERIC SIDE TIES</td>
<td>6</td>
</tr>
<tr>
<td>22756</td>
<td>25 SQ MM HV INS COPPER CABLE (COIL)</td>
<td>0.2</td>
</tr>
<tr>
<td>10886</td>
<td>LUG FOR 25 SQ MM CABLE</td>
<td>10</td>
</tr>
<tr>
<td>SET151-2</td>
<td>X-ARM TO POLE</td>
<td>1</td>
</tr>
<tr>
<td>SET152-1</td>
<td>BRACE TO POLE</td>
<td>1</td>
</tr>
<tr>
<td>10891</td>
<td>X-ARM 2700X100X100 UNDRILLED</td>
<td>1</td>
</tr>
<tr>
<td>SET173-10</td>
<td>ARRESTERS TO BRACKET</td>
<td>6</td>
</tr>
<tr>
<td>SET175-2</td>
<td>RECLOSER TO POLE</td>
<td>1</td>
</tr>
<tr>
<td>22487</td>
<td>INTELLIRUPTER</td>
<td>1</td>
</tr>
<tr>
<td>22322</td>
<td>TERMINAL LUGS FOR CCT TO PALMS</td>
<td>6</td>
</tr>
<tr>
<td>00412</td>
<td>BOLT &amp; NUT M12X40 S/S</td>
<td>12</td>
</tr>
<tr>
<td>01053</td>
<td>WASHER M12 RD S/S</td>
<td>24</td>
</tr>
<tr>
<td>01081</td>
<td>WASHER, LOCK M12</td>
<td>12</td>
</tr>
<tr>
<td>00413</td>
<td>BOLT &amp; NUT M12X50 S/S</td>
<td>6</td>
</tr>
</tbody>
</table>
11kV SHACKLE CONSTRUCTION

PG CLAMPS
AS REQUIRED

SET25A-1
EEO FUSE SWITCH
15A 600V Fuse Link Set

SET152-1
X-ARM TO POLE

20279
120sqmm CCT
To VT
22756
25sqmm insul CU

10886
LUG 25sqmm

22322
TERMINAL LUGS
120sqmm CCT
TO SWITCH PALMS

BOLT & NUT M12x60
00412
WASHER M12 RD
01053
WASHER M12 LOCK
01081
WASHER M12 RD
01053

SET274-2
ANTENNA TO X-ARM

SET155-2
POST TO X-ARM

27799
Polymeric Side Ties

SET151-1
X-ARM TO POLE

20279
120sqmm CCT

SET273-10
ARReSTER TO BRACKET

BOLT & NUT M12x50
00413
WASHER M12 RD
01053
WASHER M12 LOCK
01081
WASHER M12 RD
01053

5150 — LV ABC
construction

22487
INTELLIRUPTER

100 — LV OPEN WIRE
NOT ALLOWED

00
150
1150
150
3150 TOP K BOLT

150
1200
2700
550
650
150

255
100
600
800
100

SET152-1
BRACE TO POLE

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT
11PC1
11kV S & C INTELLIRUPTER
PULSE CLOSER

EARTHING NOT INCLUDED IN 11PC1
HVE : HV EQUIPMENT EARTH qty 2 req’d
PAGE 7-255-1 - OPEN WIRE TO ISOLATING SWITCH PALM

PAGE 7-255-2 - HV RECLOSE R BUSHING

PAGE 7-255-3 - HV RECLOSE R BUSHING TO ISOLATING SWITCH
REGULATOR ZS30-110 qty 2
Open Delta (2 TANKS)
Not included in 11REG/200R
NOTES

1. Ensure cross-arm bridging between the two poles is level.
2. Regulators not included in cu. use cu zs30-110 (3 reg'd)
3. If upgrading existing site, replace existing bridging with CCT
4. Earth from third tank to be connected to the earth on the main pole
5. Bottom bridging xarm to be at least 3m above ground
6. CCT bridging is to be used from the mains to the regulator tanks with only one bridging arm
7. CU does not contain bridging arm (11BS1)

8. Crossarm to be drilled on site.
9. Small pole to be a 14m pole

BRIDGING CROSSARM LINKING POLES
CROSSARM 3600X100X125 SC11381
SOURCE TO OPEN WIRE MAINS

NOTE:
L.H. REGULATOR SHOWN ONLY

PAGE 7-54-3

OPEN WIRE BRIDGING

TEMPORARY EARTH POSITION

CONNECTOR SECTION B

N.B. SECTION 4

TOP TIE SECTION B

HORIZONTAL BRIDGE

SET 252-2

REGULATOR

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

OHC 7 Index

REGULATOR HV BRIDGING ARRANGEMENTS
## CU LIST - 11LSRMP, 11LSRMPFF

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET272-1</td>
<td>HV SURGE ARRESTERS</td>
<td>1</td>
</tr>
<tr>
<td>SET272-2</td>
<td>SWITCH TO POLE</td>
<td>1</td>
</tr>
<tr>
<td>SET260-1</td>
<td>C/BOX BKT TO POLE</td>
<td>1</td>
</tr>
<tr>
<td>SET274-1</td>
<td>VT TO POLE</td>
<td>1</td>
</tr>
<tr>
<td>SET274-2</td>
<td>ANTENNA TO POLE</td>
<td>1</td>
</tr>
<tr>
<td>11ED02</td>
<td>EDO, 2ph CONSTN.</td>
<td>1</td>
</tr>
<tr>
<td>00412</td>
<td>BOLT &amp; NUT M12x40</td>
<td>6</td>
</tr>
<tr>
<td>01081</td>
<td>WASHER, LOCK M12</td>
<td>6</td>
</tr>
<tr>
<td>01053</td>
<td>WASHER, FLAT M12</td>
<td>6</td>
</tr>
<tr>
<td>20279</td>
<td>CCT BRIDGING</td>
<td>18</td>
</tr>
<tr>
<td>2471001</td>
<td>LOAD BREAK SWITCH</td>
<td>1</td>
</tr>
<tr>
<td>13401</td>
<td>EDO FUSES 3A-“K”</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>PG CONNECTORS AR AR</td>
<td></td>
</tr>
</tbody>
</table>

### NOTES

1. Surge arrestors and bridging supplied with switch.
2. Remote controlled switches are normally mounted to road side.
3. Control Box to be mounted for access from footpath side of pole or as determined on site in difficult terrain.
4. VT L.V. terminal supplied complete with HRC secondary fuses.
5. Stock code for VT secondary fuse holder is 20285
6. Stock code for VT secondary fuse is 04413 (5 Amp)
8. In areas where CCT mains exist, strip small section of CCT near top xarm on each phase to allow for phasing out.
9. Maintain minimum separation of 150mm between earthing cables and any other equipment cables.
10. Install wildlife proofing insulating hoods (supplied with switch and VT) over all bushings and surge arresters.
11. Construction limited to 400A by bridging, Switch rated at 630A

---

**OVERHEAD CONSTRUCTION MANUAL**

**POLE MOUNTED PLANT**

11LSRMP, 11LSRMPFF

11kV REMOTE CONTROLLED LOAD BREAK SWITCH MID POLE MOUNTED - SCHNEIDER RL27

**TECH STDS** 4920-A4 H

**DATE** 4/6/2009

**COPYRIGHT 2009 ENERGEX**

This drawing must not be reproduced in part or whole without written permission from ENERGEX

**THIS PAGE TO BE READ WITH PAGE 402**

---

**APPD**

**RECD**

**SECT** 7

**PAGE** 401

**OWN** JOHN TUNNEY

**FILE**
MATERIAL LIST - PTCOM

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>03215</td>
<td>STAPLE</td>
<td>AR</td>
</tr>
<tr>
<td>04926</td>
<td>SADDLE</td>
<td>24</td>
</tr>
<tr>
<td>06122</td>
<td>CONNECTOR</td>
<td>3</td>
</tr>
<tr>
<td>02518</td>
<td>EARTH GUARD 2.7m BLACK PVC</td>
<td>1</td>
</tr>
<tr>
<td>06259</td>
<td>LUG, 19/178</td>
<td>2</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/178 Cu</td>
<td>10</td>
</tr>
<tr>
<td>1430 or 17765</td>
<td>NAIL</td>
<td>30mm Lg OR SCREW 30mm Lg</td>
</tr>
<tr>
<td>22517</td>
<td>SCREWS 50mm Lg (Earth Guard)</td>
<td>AR</td>
</tr>
</tbody>
</table>

**DESCRIPTION**

- **SADDLE & NAILS/SCREWS**
- **EARTHGUARD & HEX HD SCREWS**
- **ADDITIONAL EARTHING IF REQUIRED**
  - SECTION 8, PAGE 8-101

**OVERHEAD CONSTRUCTION MANUAL**

**POLE MOUNTED PLANT**

**PTCOM**

**Transformer Common Earth**

(WOOD POLE)

**OVERVIEW**

- TO TRF NEUTRAL PALM IF:
  - PT SUPPLIES OPEN WIRE LV NETWORK
  - OR PT IS 25kVA DIRECT SERVICE/S
- TO NEUTRAL BUS IF PT SUPPLIES LV ABC NETWORK
- TO TRANSFORMER - TANK
- TO LV MONITORING BRACKET
- 1 ohm MAX CONNECTED
- 30 ohm MAX DISCONNECTED
MATERIAL LIST - HVE1

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>HVEXEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>00611</td>
<td>BOLT &amp; NUT, M12 x 30, SS</td>
<td>3</td>
</tr>
<tr>
<td>01053</td>
<td>WASHER, M12, RD, SS</td>
<td>3</td>
</tr>
<tr>
<td>01081</td>
<td>WASHER, M12, LOCK, SS</td>
<td>3</td>
</tr>
<tr>
<td>06122</td>
<td>PG CLAMP</td>
<td>2</td>
</tr>
<tr>
<td>22510</td>
<td>EARTH GUARD</td>
<td>1</td>
</tr>
<tr>
<td>06259</td>
<td>LUG 19/1.78</td>
<td>4</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/1.78 Cu.</td>
<td>20m</td>
</tr>
<tr>
<td>06338</td>
<td>DRIVING POINT NORMAL</td>
<td>AR</td>
</tr>
<tr>
<td>06339</td>
<td>DRIVING POINT STAR</td>
<td>AR</td>
</tr>
<tr>
<td>12952</td>
<td>CONNECTION &quot;C&quot;</td>
<td>1</td>
</tr>
<tr>
<td>22946</td>
<td>EARTH ROD</td>
<td>1</td>
</tr>
</tbody>
</table>

NOTE:
1. For two or more control boxes LOOP Earth Bond Wire.
2. Control box to be 150 min. from Earthwire Downlead.
3. Control cable to be 50 min from Earth Bond Wire.
4. Where bottom of box is required to be mounted lower than 2400, an earth mat arrangement shall be installed as per layout below.

NOTE 4

- GRADING RING
  - 3 Electrodes @ 1.2m Radius from front of control box

- 30 Ohm Max
  - combined ring & butt earth

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

HVE1 (WOOD POLE)
HV EQUIPMENT EARTH (SEPARATE EARTH AREA)
SUFFS NOJA & SCHNEIDER EQUIPMENT

EARTHGUARD 22518 SCREWS 22517

ADDITIONAL EARTHING F REQUIRED
(SECTION 8, PAGE 8-10)

EARTHWIRE DOWNLEAD 19/1.78 Cu
PVC INSULATED

SADDLES & NAILS/SCREWS

PG CLAMP

EARTH GUARD

LUG 19/1.78

CONTROL CABLE

TO HV EQUIPMENT (TANK)

EARTH CONNECTION

TO HV EQUIPMENT
(NOTE 3)

CONTROL BOX
(NOTE 1 & 2)

30 ohm MAX

30 ohm MAX

without grading ring

with grading ring

This drawing must not be reproduced in part or whole without written permission from ENERGEX.
MATERIAL LIST

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>03215</td>
<td>STAPLE</td>
</tr>
<tr>
<td>04926</td>
<td>SADDLE</td>
</tr>
<tr>
<td>06122</td>
<td>PG CLAMP</td>
</tr>
<tr>
<td>22518</td>
<td>EARTH GUARD</td>
</tr>
<tr>
<td>06259</td>
<td>LUG 19/178</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/1.78 Cu.</td>
</tr>
<tr>
<td>00411</td>
<td>BOLT &amp; NUT, M12 x 30, SS</td>
</tr>
<tr>
<td>01053</td>
<td>WASHER, M12, RD, SS</td>
</tr>
<tr>
<td>01081</td>
<td>WASHER, M12, LOCK, SS</td>
</tr>
</tbody>
</table>

NOTE:
1. For two or more control boxes LOOP Earth Bond Wire.
   from one control box to the other.
2. Control box to be 150 min. from Earthwire Downlead.
3. Control cable to be 50 min. from Earth Bond Wire.

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

HVE2 (WOOD POLE)
HV EQUIPMENT EARTH (COMMON EARTH AREA)
SUITS ALL NOJA & SCHNEIDER EQUIPMENT
MATERIAL LIST - ABSE3

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>04926</td>
<td>SADDLE</td>
<td>24</td>
</tr>
<tr>
<td>22518</td>
<td>EARTGUARD</td>
<td>1</td>
</tr>
<tr>
<td>06259</td>
<td>LUG, 19/178</td>
<td>4</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/178 Cu.</td>
<td>20</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE DOWNLEAD 19/178 Cu. PVC INSULATED</td>
<td></td>
</tr>
</tbody>
</table>

DESCRIPTION

SADDLE EARTGUARD LUG, 19/178 EARTHWIRE 19/178 Cu.

PIPE DOWN ROD
EARTGUARD 22518 SCREWS 22517
BOTTOM COUPLING
EARTHING BRAID SUPPLIED WITH SWITCH CONNECT BETWEEN DOWNROD COUPLING & BRACKET

SADDLES & NAILS/SCREWS (500mm INTERVALS)

ADDITIONAL EARTHING IF REQUIRED (SECTION 8, PAGE 8-10)

TO HV SURGE ARRESTER AT CABLE TERM
TO LV NEUTRAL (CONNECTOR - PAGE 8-33)

OVERHEAD CONSTRUCTION MANUAL
POLE MOUNTED PLANT
ABSE3
ABS & CABLE GUARD COMMON EARTH (WOOD POLE)

COPYRIGHT 2011 ENERGEX

This drawing must not be reproduced in part or whole without written permission from ENERGEX.

Uncontrolled Document when Printed
MATERIAL LIST - ABSES

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>04926</td>
<td>SADDLE</td>
<td>24</td>
</tr>
<tr>
<td>06122</td>
<td>CONNECTOR</td>
<td>1</td>
</tr>
<tr>
<td>06144</td>
<td>COUPLING</td>
<td>AR</td>
</tr>
<tr>
<td>22946</td>
<td>EARTH ROD</td>
<td>1</td>
</tr>
<tr>
<td>22518</td>
<td>EARTH GUARD</td>
<td>1</td>
</tr>
<tr>
<td>06259</td>
<td>LUG 19/1.78</td>
<td></td>
</tr>
<tr>
<td>06338</td>
<td>DRIVING POINT NORMAL</td>
<td>1</td>
</tr>
<tr>
<td>06339</td>
<td>DRIVING POINT STAR</td>
<td>AR</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE DOWNLEAD 19/1.78</td>
<td>PVC INSULATED</td>
</tr>
<tr>
<td>12952</td>
<td>CONNECTOR 'C'</td>
<td>1</td>
</tr>
<tr>
<td>14318</td>
<td>MARKING TAPE</td>
<td>AR</td>
</tr>
<tr>
<td>16914</td>
<td>100mm SPLIT CONDUIT</td>
<td>AR</td>
</tr>
</tbody>
</table>

This drawing must not be reproduced in part or whole without written permission from ENERGEX.

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

ABSE5
ABS & CABLE GUARD SEPARATE EARTH (WOOD POLE)
# Material List - ABSE4

<table>
<thead>
<tr>
<th>Stock Code</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>04926</td>
<td>Saddle</td>
<td>24</td>
</tr>
<tr>
<td>06122</td>
<td>Connector</td>
<td>1</td>
</tr>
<tr>
<td>06144</td>
<td>Coupling AR</td>
<td></td>
</tr>
<tr>
<td>22946</td>
<td>Earth Rod</td>
<td>1</td>
</tr>
<tr>
<td>22518</td>
<td>Earth Guard</td>
<td>2</td>
</tr>
<tr>
<td>06259</td>
<td>LUG 19/1.78</td>
<td>1</td>
</tr>
<tr>
<td>06338</td>
<td>Driving Point Normal AR</td>
<td></td>
</tr>
<tr>
<td>06339</td>
<td>Driving Point Star AR</td>
<td></td>
</tr>
<tr>
<td>07235</td>
<td>Earthwire Downlead 19/1.78 (Cu)</td>
<td></td>
</tr>
<tr>
<td>06259</td>
<td>LUG 19/1.78</td>
<td></td>
</tr>
<tr>
<td>12952</td>
<td>Connector 'C'</td>
<td>1</td>
</tr>
<tr>
<td>06338</td>
<td>Driving Point Normal AR</td>
<td></td>
</tr>
<tr>
<td>06339</td>
<td>Driving Point Star AR</td>
<td></td>
</tr>
<tr>
<td>07235</td>
<td>Earthwire Downlead 19/1.78 (Cu)</td>
<td></td>
</tr>
<tr>
<td>06259</td>
<td>LUG 19/1.78</td>
<td></td>
</tr>
</tbody>
</table>

**Diagram Notes:**
- **HV Earth Connected**
- **EARTH WIRE TRENCH**
- **DEPTH AND ADDITIONAL EARTHING IF REQUIRED**
  - (SECTION 8, PAGE 8-101)
- **ADDITIONAL EARTHING IF REQUIRED**
  - (SECTION 8, PAGE 8-101)
- **ADDITIONAL EARTHING**
- **WOOD POLE**
- **STAPLES**
- **BUTT EARTH (STRIP INSULATION)**
- **SADDLES & NAILS/SCREWS**
  - (500mm INTERVALS)
- **TO HV SURGE ARRESTER**
- **AIR BREAK SWITCH OPERATING HANDLE**

This drawing must not be reproduced in part or whole without written permission from EnergeX.

---

**Overhead Construction Manual**

**POLE MOUNTED PLANT**

**ABSE4**

**ABS & SURGE ARRESTER SEPARATE EARTH (WOOD POLE)**

**COPYRIGHT 2012 ENEGRAX**

APP'D P.Pearl DATE 18-12-92

RECD R.Walker

OWN M.W.

FILE 4920-A4 F

SC2284

0HC 7 Index
## Material List

<table>
<thead>
<tr>
<th>Stock Code</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>04926</td>
<td>Saddle</td>
<td>24</td>
</tr>
<tr>
<td>06122</td>
<td>Connector</td>
<td>1</td>
</tr>
<tr>
<td>06144</td>
<td>Coupling AR</td>
<td></td>
</tr>
<tr>
<td>22946</td>
<td>Earth Rod</td>
<td>1</td>
</tr>
<tr>
<td>22518</td>
<td>Earth Guard</td>
<td>1</td>
</tr>
<tr>
<td>06259</td>
<td>Lug 19/1/78</td>
<td>1</td>
</tr>
<tr>
<td>06338</td>
<td>Driving Point Normal</td>
<td>AR</td>
</tr>
<tr>
<td>06339</td>
<td>Driving Point Star</td>
<td>AR</td>
</tr>
<tr>
<td>07255</td>
<td>Earthwire 19/1/78</td>
<td>20</td>
</tr>
<tr>
<td>12952</td>
<td>Connector &quot;C&quot;</td>
<td>1</td>
</tr>
<tr>
<td>14318</td>
<td>Marking Tape AR</td>
<td></td>
</tr>
<tr>
<td>16914</td>
<td>100mm Split Conduit</td>
<td>AR</td>
</tr>
</tbody>
</table>

### Description

**CGES**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthwire Downlead 19/1/78, Cu PVC Insulated</td>
<td>1</td>
</tr>
<tr>
<td>HV Cable</td>
<td>1</td>
</tr>
<tr>
<td>100mm Heavy Duty Split Grey Conduit</td>
<td>1</td>
</tr>
<tr>
<td>HV Cable is Jute Covered</td>
<td>1</td>
</tr>
<tr>
<td>Cable Guard</td>
<td>1</td>
</tr>
<tr>
<td>Earthwire Trench Depth and Additional Earthing if Required</td>
<td>1</td>
</tr>
<tr>
<td>Section 8, Page 8-101</td>
<td>1</td>
</tr>
<tr>
<td>Butt Earth (Strip Insulation) Staples</td>
<td>1</td>
</tr>
<tr>
<td>Saddles &amp; Nails/Screws (500mm intervals)</td>
<td>1</td>
</tr>
</tbody>
</table>

---

**Overhead Construction Manual**

**Pole Mounted Plant**

**CGES**

**Cable Guard Separate Earth**

(Wood Pole)
### MATERIAL LIST - CGEC

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>04926</td>
<td>SADDLE</td>
<td>24</td>
</tr>
<tr>
<td>06122</td>
<td>CONNECTOR</td>
<td>1</td>
</tr>
<tr>
<td>22518</td>
<td>EARTHGUARD</td>
<td>1</td>
</tr>
<tr>
<td>06259</td>
<td>LUG, 19/1.78</td>
<td>1</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/1.78 Cu.</td>
<td>20</td>
</tr>
</tbody>
</table>

**EARTHGUARD 22518 SCREWS 22517**

**NOTE:**

FOR LV CABLES ONLY:

- IF THE LV CABLE INSIDE THE CABLE GUARD IS NOT ADDITIONALLY PROTECTED BY CONDUIT, THE CABLE GUARD SHALL BE EARTHED TO THE VALUE OF 30 OHMS MAX (DISCONNECTED) AND BONDED TO THE LV NEUTRAL.
- IF THE LV CABLE INSIDE THE CABLE GUARD IS ADDITIONALLY PROTECTED BY CONDUIT, THE CABLE GUARD IS NOT REQUIRED TO BE EARTHED.

**ADDITIONAL EARTHING IF REQUIRED** (SECTION 8, PAGE 8-101)

- SADDLES & NAILS/SCREWS (500mm INTERVALS)
- BUTT EARTH (STRIP INSULATION) STAPLES

**OVERHEAD CONSTRUCTION MANUAL**

**POLE MOUNTED PLANT**

- CGEC (WOOD POLE)
- CABLE EARTH GUARD (COMMON)
MATERIAL LIST - HVE3

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>00411</td>
<td>BOLT &amp; NUT, M12 x 30, SS</td>
</tr>
<tr>
<td>01053</td>
<td>WASHER, M12, RD, SS</td>
</tr>
<tr>
<td>01081</td>
<td>WASHER, M12, LOCK, SS</td>
</tr>
<tr>
<td>04926</td>
<td>SADDLE 24</td>
</tr>
<tr>
<td>06122</td>
<td>CONNECTOR 2</td>
</tr>
<tr>
<td>22518</td>
<td>EARTH GUARD 1</td>
</tr>
<tr>
<td>06258</td>
<td>LUG 19/1.78 x M10 HOLE 1</td>
</tr>
<tr>
<td>06259</td>
<td>LUG 19/1.78 x M12 HOLE 1</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/1.78 Cu. (50mm²) 22m</td>
</tr>
</tbody>
</table>

**NOTE:**
1. Control box, control cable, isolation transformer, associated equipment and wiring to be 150 min from earthwire downlead.
2. Radio Antenna above HV mains.
3. Radio Antenna below HV mains.
4. 19/1.78 (50mm²) Cu earthwire to first earthrod.
5. Minimum 50mm² earth bond wire from isolation transformer to control box earth studs.
6. Install 6mm² earth tail with lug from neutral to earth stud on control box.

---

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT

HVE3

Nulec "RL", "L" & "N" Series Switches
HV Equipment Earth Type 3 (Separate Earth)

HVE3 MANUAL

© COPYRIGHT 2011 ENERGEX

This drawing must not be reproduced in part or whole without written permission from ENERGEX

4920-A41E
# MATERIAL LIST - HVE4

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>HVE4</th>
<th>HVE4A</th>
<th>HVE4B</th>
<th>HVE4C</th>
<th>HVE4D</th>
</tr>
</thead>
<tbody>
<tr>
<td>00411</td>
<td>BOLT &amp; NUT, M12 x 30, SS</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>01053</td>
<td>WASHER, M12, RD, SS</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>01081</td>
<td>WASHER, M12, LOCK, SS</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>04926</td>
<td>SADDLE</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>06122</td>
<td>CONNECTOR</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>22518</td>
<td>EARTH GUARD</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>06258</td>
<td>LUG 19/178 x M10</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>00259</td>
<td>LUG 19/178 x M12</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/178 Cu.</td>
<td>22m</td>
<td>25m</td>
<td>25m</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

## NOTE

1. Control box, associated equipment and wiring to be 150mm from earthwire downlead.
2. Control cable to be 150 min. from Earthwire Downlead.
3. Radio Antenna above HV mains.
4. Radio Antenna below HV mains.
5. 19/178 (50mm²) Cu Earthwire to first earthrod.

---

### OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT  
HVE4  
NULEC "RL", "L" AND "N" SERIES SWITCHES  
HV EQUIPMENT EARTH (TYPE 4, COMMON)
**MATERIAL LIST**

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>00411</td>
<td>SETSCREW, M12 x 30 SS</td>
<td>2</td>
</tr>
<tr>
<td>01053</td>
<td>WASHER, M12, RD, SS</td>
<td>2</td>
</tr>
<tr>
<td>01081</td>
<td>WASHER, M12, LOCK, SS</td>
<td>2</td>
</tr>
<tr>
<td>02539</td>
<td>LUG, 19/178</td>
<td>6</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/178 Cu</td>
<td>8</td>
</tr>
<tr>
<td>02634</td>
<td>RIGID CONDUIT 25 mm</td>
<td>2</td>
</tr>
<tr>
<td>04444</td>
<td>FLEXIBLE CONDUIT 25 mm</td>
<td>1 length</td>
</tr>
<tr>
<td>02475</td>
<td>BANDIT STRAP 12 mm</td>
<td>2</td>
</tr>
</tbody>
</table>

**SUB-ASSY CU**

<table>
<thead>
<tr>
<th>SUB-ASSY CU</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADE</td>
<td>EARTH ROD ASSY</td>
</tr>
</tbody>
</table>

**PTCOMC - TRANSFORMER COMMON EARTH**

- **25mm RIGID CONDUIT**
- **25mm FLEXIBLE CONDUIT**
- **EARTHWIRE 19/178 Cu Black**
- **LUG FOR 19/178 sq mm CABLE**
- **1 METRE**
- **500**
- **EARTH FERRULE**
- **CONCRETE POLE**
- **EARTHWIRE 19/178 Cu Black**
- **BUTT ELECTRODE**
- **(S/S PLATE SUPPLIED WITH POLE)**

**OVERHEAD CONSTRUCTION MANUAL**

**POLE MOUNTED PLANT**

**PTCOMC**

**CONCRETE POLE**

**TRANSFORMER COMMON EARTH**
LV NEUTRAL DISCONNECTED.

HV TANK DISCONNECTED.

SEPARATE EARTH.

TO TRANSFORMER - TANK (HV EARTH).

EARTH FERRULE.

EARTHWIRE 19/178 Cu Black.

25mm FLEXIBLE CONDUIT.

TO NEUTRAL BUS IN LV/AC NETWORK or TRF NEUTRAL IN AC NETWORK AT SEPARATE EARTHING SITES.

MAX.

~

TANK

10 ohm MAX.

30 ohm MAX.

DISCONNECTED.

DISCONNECTED FROM NEUTRAL.

MATERIAL LIST

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>00411</td>
<td>SETSCREW, M12 x 30 SS</td>
<td>2</td>
</tr>
<tr>
<td>01053</td>
<td>WASHER, M12, RD, SS</td>
<td>2</td>
</tr>
<tr>
<td>01081</td>
<td>WASHER, M12, LOCK, SS</td>
<td>2</td>
</tr>
<tr>
<td>06259</td>
<td>LUG, 19/178</td>
<td>5</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/178 Cu</td>
<td>8</td>
</tr>
<tr>
<td>04444</td>
<td>RIGID CONDUIT 25MM</td>
<td>2 LENGTHS</td>
</tr>
<tr>
<td>16023</td>
<td>FLEXIBLE CONDUIT 25MM</td>
<td>15M</td>
</tr>
<tr>
<td>02457</td>
<td>BANDIT STRAP 12mm</td>
<td>AR</td>
</tr>
<tr>
<td>16569</td>
<td>BANDIT STRAP 12mm</td>
<td>AR</td>
</tr>
<tr>
<td>16569</td>
<td>6 sq mm XLPE</td>
<td>AR</td>
</tr>
<tr>
<td>04060</td>
<td>SPIRAL WRAP</td>
<td>AR</td>
</tr>
<tr>
<td>06249</td>
<td>LUG, 6 sq mm M8</td>
<td>1</td>
</tr>
<tr>
<td>21832</td>
<td>EXTENSION PALM M8-M12</td>
<td>1</td>
</tr>
<tr>
<td>00403</td>
<td>BOLT &amp; NUT M8-M12</td>
<td>1</td>
</tr>
<tr>
<td>01079</td>
<td>SPRING WASHER M8</td>
<td>1</td>
</tr>
<tr>
<td>06259</td>
<td>LUG, 19/178</td>
<td>5</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/178 Cu</td>
<td>8</td>
</tr>
<tr>
<td>04444</td>
<td>RIGID CONDUIT 25MM</td>
<td>2 LENGTHS</td>
</tr>
<tr>
<td>16023</td>
<td>FLEXIBLE CONDUIT 25MM</td>
<td>15M</td>
</tr>
<tr>
<td>02457</td>
<td>BANDIT STRAP 12mm</td>
<td>AR</td>
</tr>
<tr>
<td>16569</td>
<td>BANDIT STRAP 12mm</td>
<td>AR</td>
</tr>
<tr>
<td>16569</td>
<td>6 sq mm XLPE</td>
<td>AR</td>
</tr>
<tr>
<td>04060</td>
<td>SPIRAL WRAP</td>
<td>AR</td>
</tr>
<tr>
<td>06249</td>
<td>LUG, 6 sq mm M8</td>
<td>1</td>
</tr>
<tr>
<td>21832</td>
<td>EXTENSION PALM M8-M12</td>
<td>1</td>
</tr>
<tr>
<td>00403</td>
<td>BOLT &amp; NUT M8-M12</td>
<td>1</td>
</tr>
<tr>
<td>01079</td>
<td>SPRING WASHER M8</td>
<td>1</td>
</tr>
</tbody>
</table>

SUB-ASSY

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADE EARTH ROD ASSY</td>
<td>5</td>
</tr>
</tbody>
</table>

PTSEPC - TRANSFORMER SEPARATE EARTH.

OVERHEAD CONSTRUCTION MANUAL

POLE MOUNTED PLANT NTSEPC

CONCRETE POLE

TRANSFORMER SEPARATE EARTH.

EARTH ELECTRODE

1 METRE RADIUS AROUND POLE.

INSTALL 4 ELECTRODES EQUALLY SPACED AROUND POLE.

4 METRES MIN SEPARATION BETWEEN HV EARTH MAT AND ANY UNINSULATED LV EARTH COMPONENT.

HV EARTH MAT INSULATED DOWNLEAD INSTALLED INSIDE FLEXIBLE CONDUIT.

LV SEPARATE EARTH INSTALLED AT 1 METRE RADIUS AROUND POLE.

REQUIRED FOR SEPARATE EARTH.

INSTALL 4 ELECTRODES EQUALLY SPACED AROUND POLE.

EARTH ELECTRODE (IS/5 PLATE SUPPLIED WITH POLE).

EARTH FERRULE FOR ADDITIONAL EARTHING CONNECTION.

PROVIDE ADDITIONAL INSULATION BY COVERING 4 & 6 sq mm CABLE FROM MARSHALLING BOX & IPC CONNECTOR WITH SPIRAL WRAP 10490.

NOTE: CUT OFF LUG AND JOIN 6 sq mm TO 4 sq mm CABLE WITH 16569 CONNECTOR. INSERT 4 sq mm INTO "HOUSE" SIDE OF 16569.

EXTENSION PALM M8-M12.

FROM LV MARSHALLING BOX.

COPYRIGHT 2011 ENERGEX.

This drawing must not be reproduced in part or whole without written permission from ENERGEX.
MATERIAL LIST - CGE33

<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>04926</td>
<td>SADDLE</td>
<td>24</td>
</tr>
<tr>
<td>06122</td>
<td>CONNECTOR</td>
<td>1</td>
</tr>
<tr>
<td>06144</td>
<td>COUPLING</td>
<td>AR</td>
</tr>
<tr>
<td>22946</td>
<td>EARTH ROD</td>
<td>1</td>
</tr>
<tr>
<td>22518</td>
<td>EARTH GUARD</td>
<td>1</td>
</tr>
<tr>
<td>06259</td>
<td>LUG 19/1.78</td>
<td>1</td>
</tr>
<tr>
<td>06338</td>
<td>DRIVING POINT NORMAL</td>
<td>AR</td>
</tr>
<tr>
<td>06339</td>
<td>DRIVING POINT STAR</td>
<td>AR</td>
</tr>
<tr>
<td>07235</td>
<td>EARTHWIRE 19/1.78 Cu</td>
<td>20</td>
</tr>
<tr>
<td>12952</td>
<td>CONNECTOR &quot;C&quot;</td>
<td>1</td>
</tr>
<tr>
<td>14318</td>
<td>MARKING TAPE</td>
<td>AR</td>
</tr>
<tr>
<td>15075</td>
<td>PARALLEL CLAMP</td>
<td>2</td>
</tr>
</tbody>
</table>

NOTE: Ensure butt earth is connected to pole guard and neutral only - not to any HV earths.

TO LV NEUTRAL (IF REQUIRED) TO 33KV CRUCIFIX

EARTHWIRE DOWNLEADS 19/1.78... Cu PVC INSULATED

HV CABLE

SEE DETAIL A

30 ohm MAX

HV EARTH & ECC DISCONNECTED

HV EARTH

ECC (RUN BY TX UG MAINS)

LUG 19/1.78 (CABLE GUARD)

MAINTAIN 150MM SEPARATION BETWEEN HV & LV EARTHWIRE DOWN LEADS

PEOPLE CONSTRUCTION MANUAL

POLE MOUNTED PLANT CGE33
CABLE GUARD 33KV SEPARATE EARTH
(WOOD POLE)
<table>
<thead>
<tr>
<th>CU</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET600-1</td>
<td>ABS handle bond to pole nail</td>
<td>1</td>
</tr>
<tr>
<td>SET600-2</td>
<td>Metal cable guard bond to pole nail</td>
<td>1</td>
</tr>
</tbody>
</table>

**NOTES:**

1. Bond ABS or cable guard to pole nail.
2. If metal cable guard is installed, ensure guard is bonded to ABS handle and nail.
3. HV equipment separate earths (e.g. arrestor / tank) and pole nail to be separated by 50mm if not installed in HFT conduit.
4. Do not bond pole nail on SWER poles. Keep SWER earths 100mm from any other metal items.
NOTES:

1. Earth down-rods may not sit flush with the pole, particularly if there are knots or other imperfections on the pole. The rod must be positioned on the pole to be as flush as possible to prevent fingers from being placed behind the rod/guard.

2. Can be used when there is only one earth on the pole (e.g. CMEN, HV or LV earth only).

3. Do not use this on SWER earth poles.
<table>
<thead>
<tr>
<th>STOCK CODE</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>03215</td>
<td>STAPLE</td>
<td>AR</td>
</tr>
<tr>
<td>10646/9</td>
<td>COPPER SADDLE</td>
<td>20</td>
</tr>
<tr>
<td>06122</td>
<td>PG CLAMP</td>
<td>2</td>
</tr>
<tr>
<td>06259</td>
<td>LG 19/1/78</td>
<td>2</td>
</tr>
<tr>
<td>2471530</td>
<td>EARTH ROD 3m</td>
<td>2</td>
</tr>
<tr>
<td>22518</td>
<td>EARTH GUARD 15MM (SMALL)</td>
<td>1</td>
</tr>
<tr>
<td>20793</td>
<td>EARTH GUARD 30MM (LARGE)</td>
<td>1</td>
</tr>
<tr>
<td>12952</td>
<td>&quot;C&quot; CLAMP - CABLE TO ROD</td>
<td>2</td>
</tr>
<tr>
<td>104802</td>
<td>SCREWS 50mm Lg (Stainless)</td>
<td>AR</td>
</tr>
<tr>
<td>07225</td>
<td>EARTHWIRE 50 sqmm</td>
<td>AR</td>
</tr>
</tbody>
</table>

**NOTES:**

1. Earth down-rods may not sit flush with the pole, particularly if there are knots or other imperfections on the pole. The rod must be positioned on the pole to be as flush as possible to prevent fingers from being placed behind the rod/guard.

2. HV down-rod must maintain 200mm separation from the ground.

3. Only use Copper Saddles with Stainless Steel screws to hold up HV down-rods.

4. Do not use this on SWER earth poles.