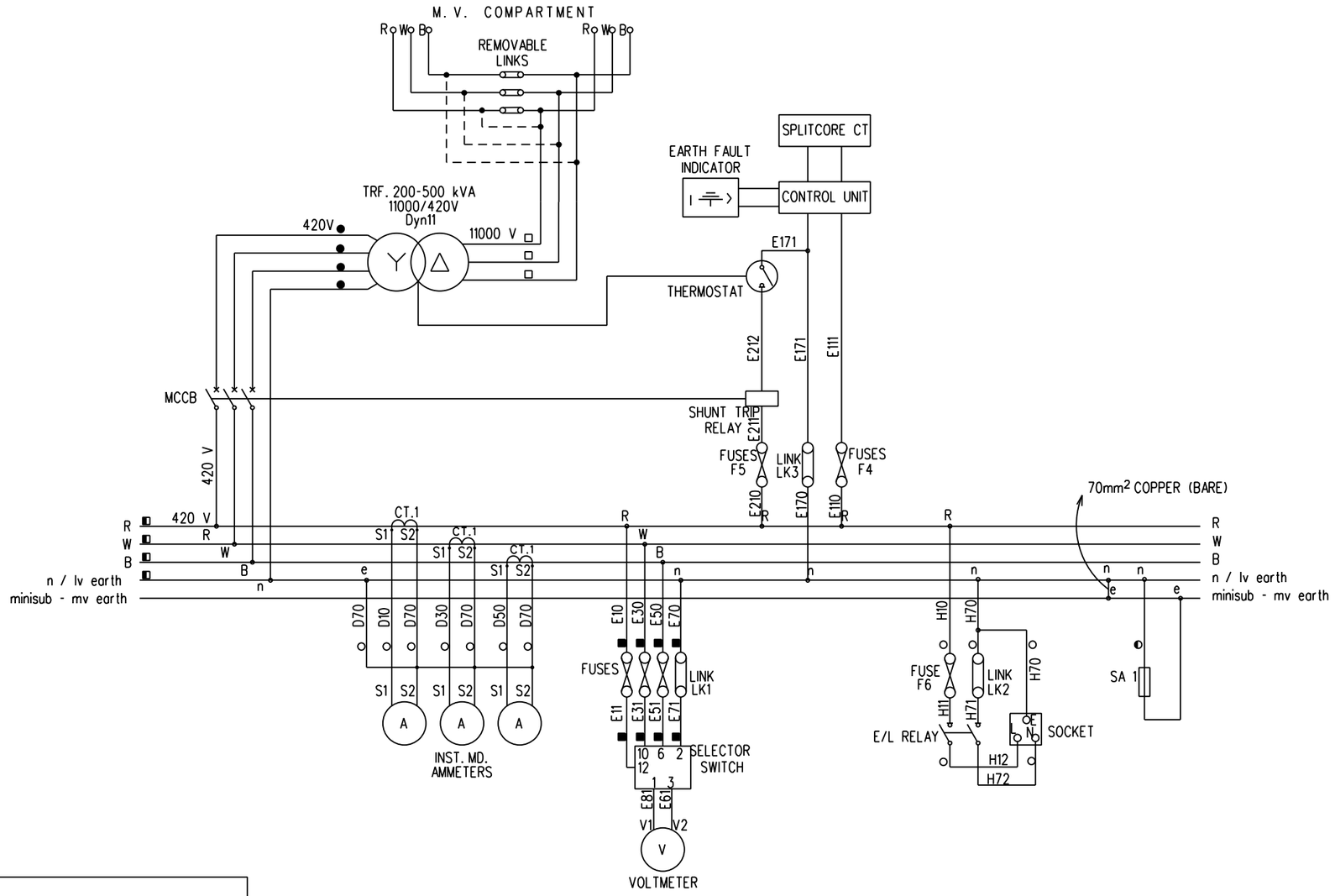


CONNECTION DETAIL

DESIGNATION	COLOUR	CONDUCTOR SIZE	LEGEND
RED PHASE VOLTAGE	RED	2.5mm²Cu	■
WHITE PHASE VOLTAGE	WHITE	2.5mm²Cu	■
BLUE PHASE VOLTAGE	BLUE	2.5mm²Cu	■
NEUTRAL PHASE VOLTAGE	BLACK	2.5mm²Cu	■
RED PHASE CURRENT	RED	4.0mm²Cu	○
WHITE PHASE CURRENT	WHITE	4.0mm²Cu	○
BLUE PHASE CURRENT	BLUE	4.0mm²Cu	○
STAR POINT	BLACK	4.0mm²Cu	○
EARTH POINTS	GREEN/YELLOW	4.0mm²Cu	○
RED PHASE VOLTAGE	N/A	25mm² Cu	□
WHITE PHASE VOLTAGE	N/A	25mm² Cu	□
BLUE PHASE VOLTAGE	N/A	25mm² Cu	□
	BLACK	16mm² Cu	◐
FOR CONNECTION DETAILS SEE NOTE 1		2.5A/mm Cu (MAX.)	●
FOR BUSBAR DETAILS SEE NOTE 1		1.8A/mm Cu (MAX.)	◧

NOTE:
(1) ALL TRFR TO BUSBAR LV CABLES TO BE SINGLE CORE AND COLOUR CODED AT BOTH ENDS. BUSBAR (R, W, B & n) AND TRFR TO BUSBAR LV CABLES TO BE RATED AS FOLLOWS.

TRFR (kVA)	RATING (A)
200	330
315	520
500	825

(2) COLOUR CODED P.V.C. WIRE FOR PHASE CONNECTED AUXILIARY WIRING

(3) GREEN P.V.C. WIRE FOR EARTH WIRING

(4) BLACK P.V.C. WIRE FOR NEUTRAL WIRING

(5) AUXILIARY WIRING TO BE FERRULED AT BOTH ENDS

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
8	REVISED METERING WIRING.	J.S.	H. GROENEWALD	H. GROENEWALD	22/11/2023	
7	AMI REQUIREMENTS ADDED	P.A.T.	T.DU PLESSIS	T.DU PLESSIS	24.09.2013	
6	VARIOUS AMMENDMENTS MADE	P.A.T.	B.MWAREHWA	R. KELLY	08.06.2010	

Eskom

AUTH: A. BEKKER
DATE: 07.12.2001
CHKD: G. WHYTE
DATE: 07.12.2001
DRAWN: P.A.VERMAAK
DATE: 09.10.2001

TYPE 'A' MINI-SUBSTATION FOR 11kV 200kVA - 500kVA SCHEMATIC AND WIRING DIAGRAM FOR AUXILIARY EQUIPMENT

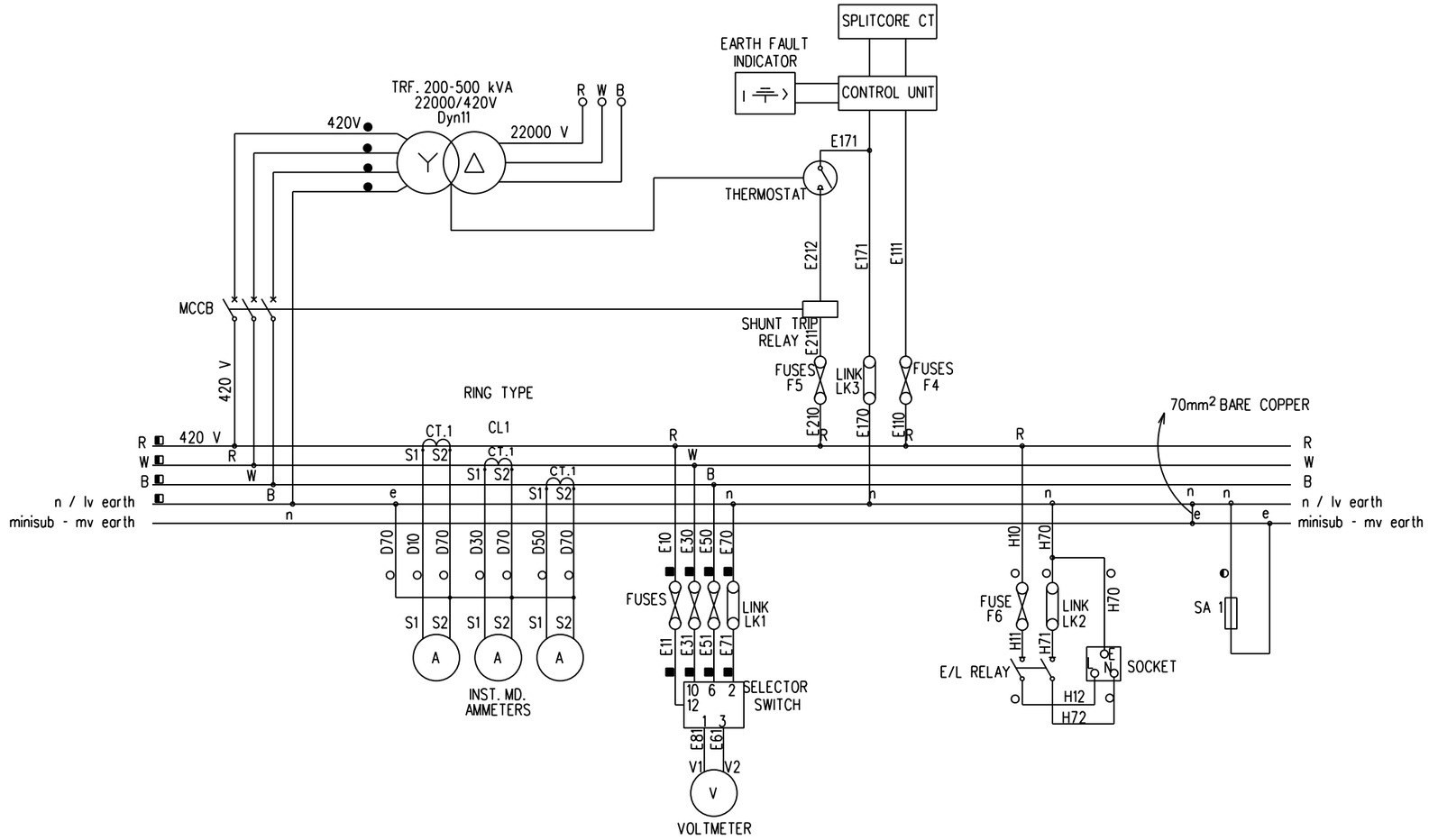
D-DT-0868

SET	SHEET	REVISION
6	1	8

A3L

CONNECTION DETAIL

DESIGNATION	COLOUR	CONDUCTOR SIZE	LEGEND
RED PHASE VOLTAGE	RED	2.5mm²Cu	■
WHITE PHASE VOLTAGE	WHITE	2.5mm²Cu	■
BLUE PHASE VOLTAGE	BLUE	2.5mm²Cu	■
NEUTRAL PHASE VOLTAGE	BLACK	2.5mm²Cu	■
RED PHASE CURRENT	RED	4.0mm²Cu	○
WHITE PHASE CURRENT	WHITE	4.0mm²Cu	○
BLUE PHASE CURRENT	BLUE	4.0mm²Cu	○
STAR POINT	BLACK	4.0mm²Cu	○
EARTH POINTS	GREEN/YELLOW	4.0mm²Cu	○
RED PHASE VOLTAGE	N/A	25mm² Cu	□
WHITE PHASE VOLTAGE	N/A	25mm² Cu	□
BLUE PHASE VOLTAGE	N/A	25mm² Cu	□
	BLACK	16mm² Cu	◐
FOR CONNECTION DETAILS SEE NOTE 1		2.5A/mm Cu (MAX.)	●
FOR BUSBAR DETAILS SEE NOTE 1		1.8A/mm Cu (MAX.)	◧



NOTE:
(1) ALL TRFR TO BUSBAR LV CABLES TO BE SINGLE CORE AND COLOUR CODED AT BOTH ENDS.
BUSBAR (R, W, B & n) AND TRFR TO BUSBAR LV CABLES TO BE RATED AS FOLLOWS.

TRFR (kVA)	RATING (A)
200	330
315	520
500	825

(2) COLOUR CODED P.V.C WIRE FOR PHASE CONNECTED AUXILIARY WIRING

(3) GREEN P.V.C. WIRE FOR EARTH WIRING

(4) BLACK P.V.C. WIRE FOR NEUTRAL WIRING

(5) AUXILIARY WIRING TO BE FERRULED AT BOTH ENDS

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
8	REVISED METERING WIRING.	J.S.	H. GROENEWALD	H. GROENEWALD	22/11/2023	
7	AMI REQUIREMENTS ADDED	P.A.T.	T.DU PLESSIS	T.DU PLESSIS	24.09.2013	
6	VARIOUS AMMENDMENTS MADE	P.A.T.	B.MWAREHWA	R. KELLY	08.06.2010	

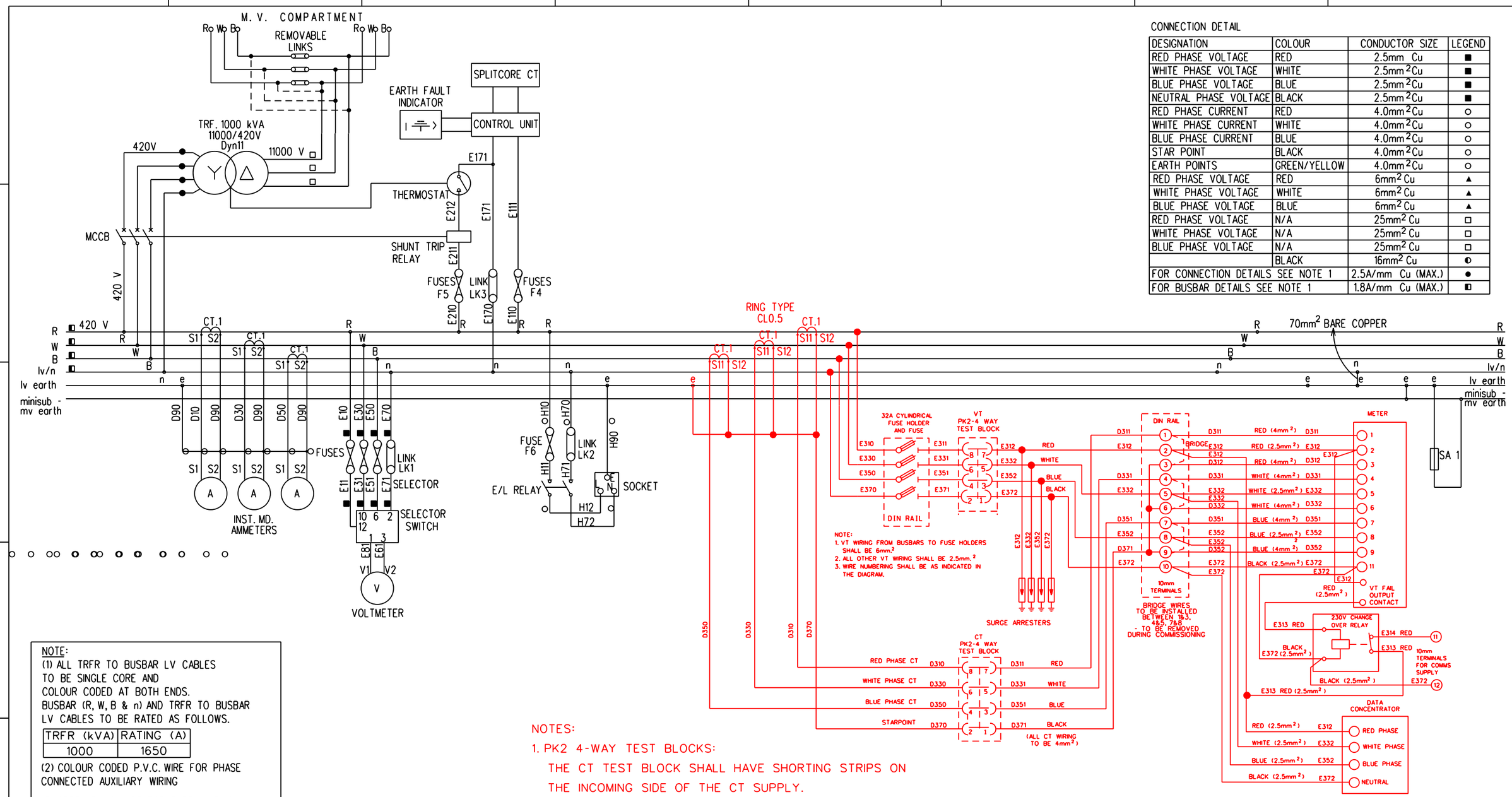
Eskom

AUTH: A. BEKKER
DATE: 07.12.2001
CHKD: G. WHYTE
DATE: 07.12.2001
DRAWN: P.A.VERMAAK
DATE: 09.10.2001

TYPE 'A' MINI-SUBSTATION FOR 22kV 200kVA - 500kVA SCHEMATIC AND WIRING DIAGRAM FOR AUXILIARY EQUIPMENT

D-DT-0868	SET	SHEET	REVISION
	6	2	8

A3L



CONNECTION DETAIL

DESIGNATION	COLOUR	CONDUCTOR SIZE	LEGEND
RED PHASE VOLTAGE	RED	2.5mm Cu	■
WHITE PHASE VOLTAGE	WHITE	2.5mm²Cu	■
BLUE PHASE VOLTAGE	BLUE	2.5mm²Cu	■
NEUTRAL PHASE VOLTAGE	BLACK	2.5mm²Cu	■
RED PHASE CURRENT	RED	4.0mm²Cu	○
WHITE PHASE CURRENT	WHITE	4.0mm²Cu	○
BLUE PHASE CURRENT	BLUE	4.0mm²Cu	○
STAR POINT	BLACK	4.0mm²Cu	○
EARTH POINTS	GREEN/YELLOW	4.0mm²Cu	○
RED PHASE VOLTAGE	RED	6mm² Cu	▲
WHITE PHASE VOLTAGE	WHITE	6mm² Cu	▲
BLUE PHASE VOLTAGE	BLUE	6mm² Cu	▲
RED PHASE VOLTAGE	N/A	25mm² Cu	□
WHITE PHASE VOLTAGE	N/A	25mm² Cu	□
BLUE PHASE VOLTAGE	N/A	25mm² Cu	□
	BLACK	16mm² Cu	◐
FOR CONNECTION DETAILS SEE NOTE 1		2.5A/mm Cu (MAX.)	●
FOR BUSBAR DETAILS SEE NOTE 1		1.8A/mm Cu (MAX.)	◧

NOTE:
(1) ALL TRFR TO BUSBAR LV CABLES TO BE SINGLE CORE AND COLOUR CODED AT BOTH ENDS. BUSBAR (R, W, B & n) AND TRFR TO BUSBAR LV CABLES TO BE RATED AS FOLLOWS.

TRFR (kVA)	RATING (A)
1000	1650

(2) COLOUR CODED P.V.C. WIRE FOR PHASE CONNECTED AUXILIARY WIRING

(3) GREEN P.V.C WIRE FOR EARTH WIRING

(4) BLACK P.V.C WIRE FOR NEUTRAL WIRING

(5) AUXILIARY WIRING TO BE FERRULED AT BOTH ENDS

(6) ALL WIRING INDICATED SHALL BE PROVIDED AND SHALL HAVE SUFFICIENT SLACK TO ALLOW THE METER PLATE TO BE HINGED OUTWARDS TO AT LEAST 90 DEG. RELATIVE TO THE MINI-SUB LV COMPARTMENT.
THE WIRING THAT IS TO BE TERMINATED ONTO THE METERS SHALL BE TAKEN THROUGH THE ø32 HOLES IN THE METER PLATE AND SHALL HAVE AT LEAST 300mm OF EXCESS WIRE WHEN MEASURED FROM THE ø32mm HOLE TO THE WIRE END WITH THE METER PLATE HINGED OUTWARDS.

NOTE:
1. VT WIRING FROM BUSBARS TO FUSE HOLDERS SHALL BE 6mm.²
2. ALL OTHER VT WIRING SHALL BE 2.5mm.²
3. WIRE NUMBERING SHALL BE AS INDICATED IN THE DIAGRAM.

NOTES:
1. PK2 4-WAY TEST BLOCKS:
   THE CT TEST BLOCK SHALL HAVE SHORTING STRIPS ON THE INCOMING SIDE OF THE CT SUPPLY.
   THE VT TEST BLOCKS SHALL HAVE NO SHORTING STRIPS.
2. METER AND DATA CONCENTRATOR TO BE SUPPLIED BY ESKOM
3. ALL CT WIRING SHALL BE 4mm²
   THE WIRING SHALL BE COLOUR CODED TO REPRESENT THE DIFFFERENT PHASES.
   WIRE NUMBERING SHALL BE AS INDICATED IN THE DIAGRAM
4. THE FUSE HOLDERS SHALL BE MOUNTED ON THE SHORT DIN RAIL
5. THE SURGE ARRESTORS, TERMINALS AND 230V CHANGE OVER RELAY SHALL BE MOUNTED ON THE LONG DIN RAIL

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
8	REVISED METERING WIRING.	J.S.	H. GROENEWALD	H. GROENEWALD	22/11/2023	
7	AMI REQUIREMENTS ADDED	P.A.T.	T.DU PLESSIS	T.DU PLESSIS	24.09.2013	
6	VARIOUS AMMENDMENTS MADE	P.A.T.	B.MWAREHWA	R. KELLY	08.06.2010	

Eskom

AUTH: A. BEKKER
DATE: 07.12.2001
CHKD: G. WHYTE
DATE: 07.12.2001
DRAWN: P.A.VERMAAK
DATE: 09.10.2001

TYPE 'A' MINI-SUBSTATION FOR 11kV 1000kVA SCHEMATIC AND WIRING DIAGRAM FOR AUXILIARY EQUIPMENT

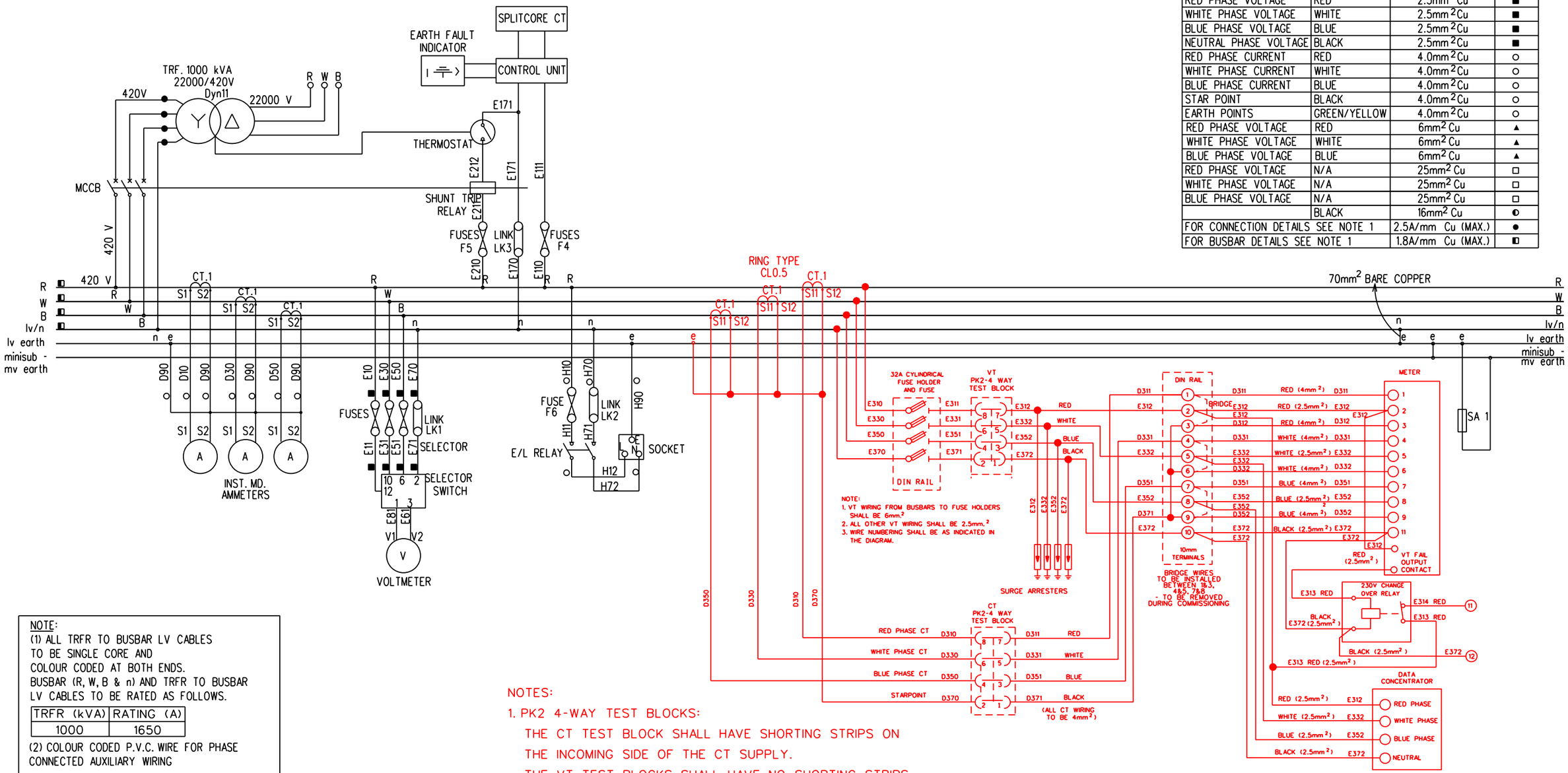
D-DT-0868

SET	SHEET	REVISION
6	3	8

A3L

CONNECTION DETAIL

DESIGNATION	COLOUR	CONDUCTOR SIZE	LEGEND
RED PHASE VOLTAGE	RED	2.5mm Cu	■
WHITE PHASE VOLTAGE	WHITE	2.5mm²Cu	■
BLUE PHASE VOLTAGE	BLUE	2.5mm²Cu	■
NEUTRAL PHASE VOLTAGE	BLACK	2.5mm²Cu	■
RED PHASE CURRENT	RED	4.0mm²Cu	○
WHITE PHASE CURRENT	WHITE	4.0mm²Cu	○
BLUE PHASE CURRENT	BLUE	4.0mm²Cu	○
STAR POINT	BLACK	4.0mm²Cu	○
EARTH POINTS	GREEN/YELLOW	4.0mm²Cu	○
RED PHASE VOLTAGE	RED	6mm² Cu	▲
WHITE PHASE VOLTAGE	WHITE	6mm² Cu	▲
BLUE PHASE VOLTAGE	BLUE	6mm² Cu	▲
RED PHASE VOLTAGE	N/A	25mm² Cu	□
WHITE PHASE VOLTAGE	N/A	25mm² Cu	□
BLUE PHASE VOLTAGE	N/A	25mm² Cu	□
	BLACK	16mm² Cu	◐
FOR CONNECTION DETAILS SEE NOTE 1		2.5A/mm Cu (MAX.)	●
FOR BUSBAR DETAILS SEE NOTE 1		1.8A/mm Cu (MAX.)	◧



NOTE:
(1) ALL TRFR TO BUSBAR LV CABLES TO BE SINGLE CORE AND COLOUR CODED AT BOTH ENDS. BUSBAR (R, W, B & n) AND TRFR TO BUSBAR LV CABLES TO BE RATED AS FOLLOWS.

TRFR (kVA)	RATING (A)
1000	1650

(2) COLOUR CODED P.V.C. WIRE FOR PHASE CONNECTED AUXILIARY WIRING

(3) GREEN P.V.C WIRE FOR EARTH WIRING

(4) BLACK P.V.C WIRE FOR NEUTRAL WIRING

(5) AUXILIARY WIRING TO BE FERRULED AT BOTH ENDS

(6) ALL WIRING INDICATED SHALL BE PROVIDED AND SHALL HAVE SUFFICIENT SLACK TO ALLOW THE METER PLATE TO BE HINGED OUTWARDS TO AT LEAST 90 DEG. RELATIVE TO THE MINI-SUB LV COMPARTMENT.
THE WIRING THAT IS TO BE TERMINATED ONTO THE METERS SHALL BE TAKEN THROUGH THE ø32 HOLES IN THE METER PLATE AND SHALL HAVE AT LEAST 300mm OF EXCESS WIRE WHEN MEASURED FROM THE ø32mm HOLE TO THE WIRE END WITH THE METER PLATE HINGED OUTWARDS.

NOTES:
1. PK2 4-WAY TEST BLOCKS:
   THE CT TEST BLOCK SHALL HAVE SHORTING STRIPS ON THE INCOMING SIDE OF THE CT SUPPLY.
   THE VT TEST BLOCKS SHALL HAVE NO SHORTING STRIPS.
2. METER AND DATA CONCENTRATOR TO BE SUPPLIED BY ESKOM
3. ALL CT WIRING SHALL BE 4mm²
   THE WIRING SHALL BE COLOUR CODED TO REPRESENT THE DIFFFERENT PHASES.
   WIRE NUMBERING SHALL BE AS INDICATED IN THE DIAGRAM
4. THE FUSE HOLDERS SHALL BE MOUNTED ON THE SHORT DIN RAIL
5. THE SURGE ARRESTORS, TERMINALS AND 230V CHANGE OVER RELAY SHALL BE MOUNTED ON THE LONG DIN RAIL

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
8	REVISED METERING WIRING.	J.S.	H. GROENEWALD	H. GROENEWALD	22/11/2023	
7	AMI REQUIREMENTS ADDED	P.A.T.	T.DU PLESSIS	T.DU PLESSIS	24.09.2013	
6	VARIOUS AMMENDMENTS MADE	P.A.T.	B.MWAREHWA	R. KELLY	08.06.2010	

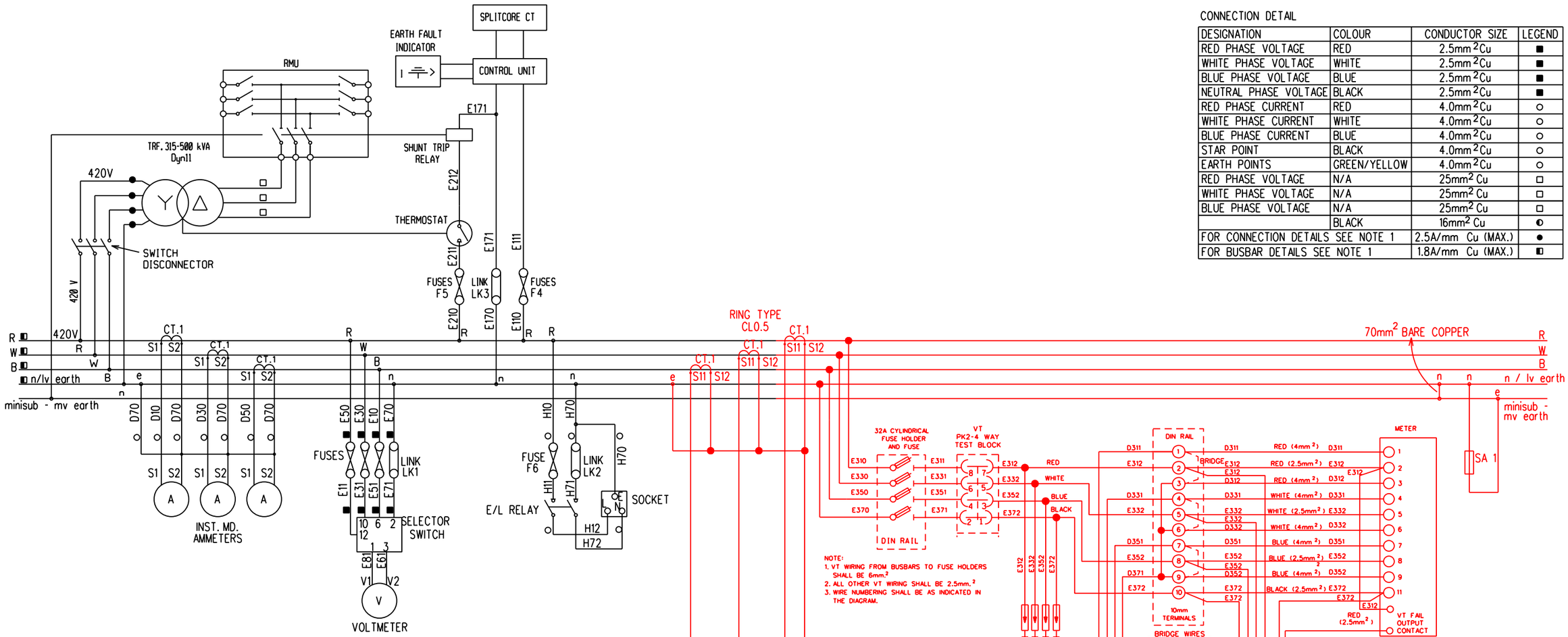
Eskom

AUTH: A. BEKKER
DATE: 07.12.2001
CHKD: G. WHYTE
DATE: 07.12.2001
DRAWN: P.A.VERMAAK
DATE: 09.10.2001

TYPE 'A' MINI-SUBSTATION FOR 22kV 1000kVA SCHEMATIC AND WIRING DIAGRAM FOR AUXILIARY EQUIPMENT

D-DT-0868	SET	SHEET	REVISION
	6	4	8

A3L



CONNECTION DETAIL

DESIGNATION	COLOUR	CONDUCTOR SIZE	LEGEND
RED PHASE VOLTAGE	RED	2.5mm²Cu	■
WHITE PHASE VOLTAGE	WHITE	2.5mm²Cu	■
BLUE PHASE VOLTAGE	BLUE	2.5mm²Cu	■
NEUTRAL PHASE VOLTAGE	BLACK	2.5mm²Cu	■
RED PHASE CURRENT	RED	4.0mm²Cu	○
WHITE PHASE CURRENT	WHITE	4.0mm²Cu	○
BLUE PHASE CURRENT	BLUE	4.0mm²Cu	○
STAR POINT	BLACK	4.0mm²Cu	○
EARTH POINTS	GREEN/YELLOW	4.0mm²Cu	○
RED PHASE VOLTAGE	N/A	25mm² Cu	□
WHITE PHASE VOLTAGE	N/A	25mm² Cu	□
BLUE PHASE VOLTAGE	N/A	25mm² Cu	□
	BLACK	16mm² Cu	◐
FOR CONNECTION DETAILS SEE NOTE 1		2.5A/mm Cu (MAX.)	●
FOR BUSBAR DETAILS SEE NOTE 1		1.8A/mm Cu (MAX.)	◧

NOTE:
(1) ALL TRFR TO BUSBAR LV CABLES TO BE SINGLE CORE AND COLOUR CODED AT BOTH ENDS.
BUSBAR (R, W, B & n) AND TRFR TO BUSBAR LV CABLES TO BE RATED AS FOLLOWS.

TRFR (kVA)	RATING (A)
315	520
500	825

(2) COLOUR CODED P.V.C. WIRE FOR PHASE CONNECTED AUXILIARY WIRING

(3) GREEN P.V.C. WIRE FOR EARTH WIRING

(4) BLACK P.V.C. WIRE FOR NEUTRAL WIRING

(5) AUXILIARY WIRING TO BE FERRULED AT BOTH ENDS

(6) ALL WIRING INDICATED SHALL BE PROVIDED AND SHALL HAVE SUFFICIENT SLACK TO ALLOW THE AMI CONCENTRATOR PLATE TO BE HINGED OUTWARDS TO AT LEAST 90 DEG. RELATIVE TO THE MINI-SUB LV COMPARTMENT.
THE WIRING THAT IS TO BE TERMINATED ONTO THE METERS SHALL BE TAKEN THROUGH THE ø32 HOLES IN THE METER PLATE AND SHALL HAVE AT LEAST 300mm OF EXCESS WIRE WHEN MEASURED FROM THE o32mm HOLE TO THE WIRE END WITH THE METER PLATE HINGED OUTWARDS.

NOTES:
1. PK2 4-WAY TEST BLOCKS:
   THE CT TEST BLOCK SHALL HAVE SHORTING STRIPS ON THE INCOMING SIDE OF THE CT SUPPLY.
   THE VT TEST BLOCKS SHALL HAVE NO SHORTING STRIPS.
2. METER AND DATA CONCENTRATOR TO BE SUPPLIED BY ESKOM
3. ALL CT WIRING SHALL BE 4mm²
   THE WIRING SHALL BE COLOUR CODED TO REPRESENT THE DIFFFERENT PHASES.
   WIRE NUMBERING SHALL BE AS INDICATED IN THE DIAGRAM
4. THE FUSE HOLDERS SHALL BE MOUNTED ON THE SHORT DIN RAIL
5. THE SURGE ARRESTORS, TERMINALS AND 230V CHANGE OVER RELAY SHALL BE MOUNTED ON THE LONG DIN RAIL

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
8	REVISED METERING WIRING.	J.S.	H. GROENEWALD	H. GROENEWALD	22/11/2023	
7	AMI REQUIREMENTS ADDED	P.A.T.	T.DU PLESSIS	T.DU PLESSIS	24.09.2013	
6	VARIOUS AMMENDMENTS MADE	P.A.T.	B.MWAREHWA	R. KELLY	08.06.2010	

Eskom

AUTH: A. BEKKER
DATE: 07.12.2001
CHKD: G. WHYTE
DATE: 07.12.2001
DRAWN: P.A.VERMAAK
DATE: 09.10.2001

TYPE 'B' MINI-SUBSTATION FOR 11kV + 22kV 315kVA - 500kVA SCHEMATIC AND WIRING DIAGRAM FOR AUXILIARY EQUIPMENT

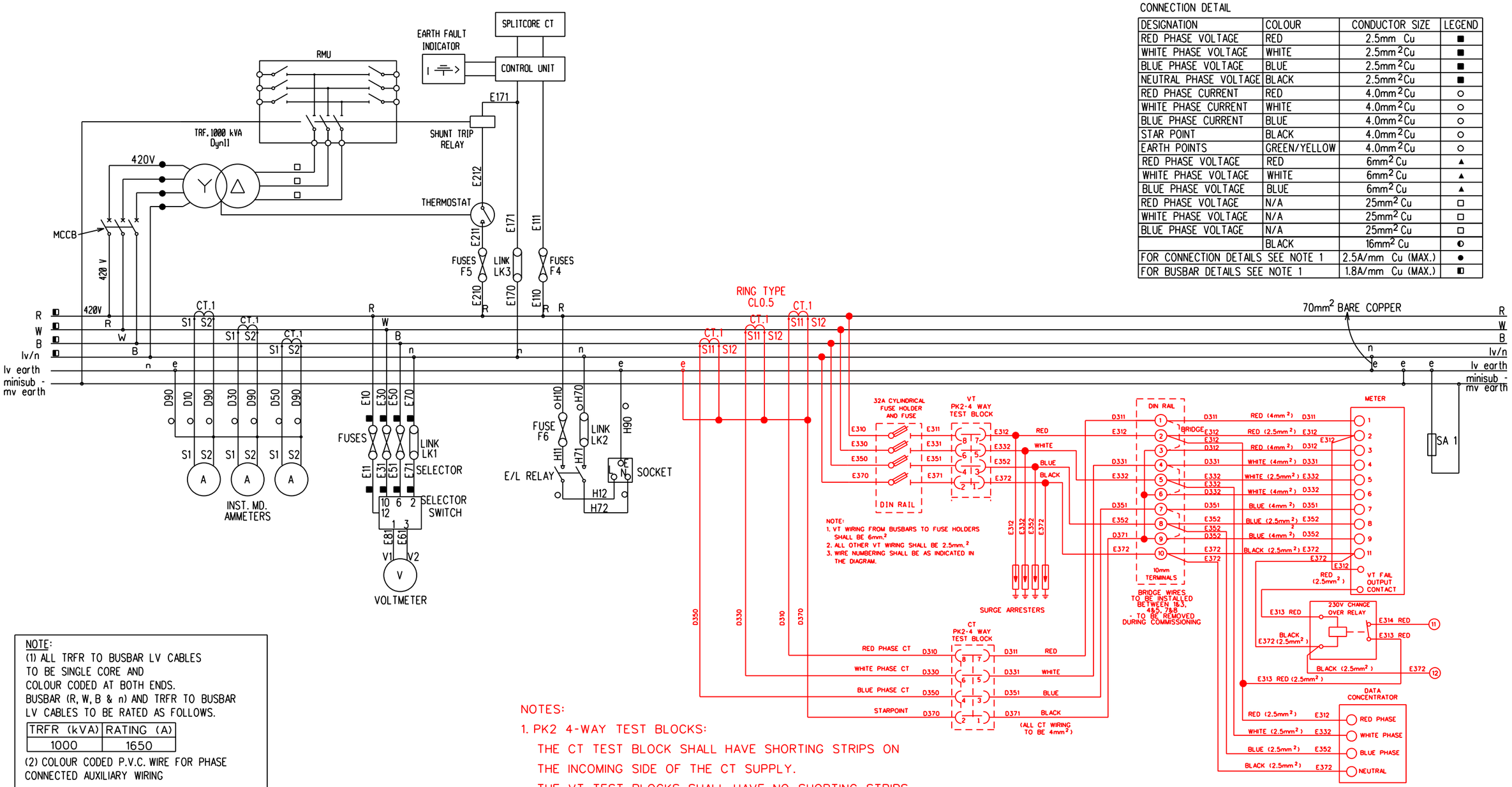
D-DT-0868

SET	SHEET	REVISION
6	5	8

A3L

CONNECTION DETAIL

DESIGNATION	COLOUR	CONDUCTOR SIZE	LEGEND
RED PHASE VOLTAGE	RED	2.5mm Cu	■
WHITE PHASE VOLTAGE	WHITE	2.5mm²Cu	■
BLUE PHASE VOLTAGE	BLUE	2.5mm²Cu	■
NEUTRAL PHASE VOLTAGE	BLACK	2.5mm²Cu	■
RED PHASE CURRENT	RED	4.0mm²Cu	○
WHITE PHASE CURRENT	WHITE	4.0mm²Cu	○
BLUE PHASE CURRENT	BLUE	4.0mm²Cu	○
STAR POINT	BLACK	4.0mm²Cu	○
EARTH POINTS	GREEN/YELLOW	4.0mm²Cu	○
RED PHASE VOLTAGE	RED	6mm² Cu	▲
WHITE PHASE VOLTAGE	WHITE	6mm² Cu	▲
BLUE PHASE VOLTAGE	BLUE	6mm² Cu	▲
RED PHASE VOLTAGE	N/A	25mm² Cu	□
WHITE PHASE VOLTAGE	N/A	25mm² Cu	□
BLUE PHASE VOLTAGE	N/A	25mm² Cu	□
	BLACK	16mm² Cu	◐
FOR CONNECTION DETAILS SEE NOTE 1		2.5A/mm Cu (MAX.)	●
FOR BUSBAR DETAILS SEE NOTE 1		1.8A/mm Cu (MAX.)	◧



NOTE:
1. VT WIRING FROM BUSBARS TO FUSE HOLDERS SHALL BE 6mm².
2. ALL OTHER VT WIRING SHALL BE 2.5mm².
3. WIRE NUMBERING SHALL BE AS INDICATED IN THE DIAGRAM.

NOTE:
(1) ALL TRFR TO BUSBAR LV CABLES TO BE SINGLE CORE AND COLOUR CODED AT BOTH ENDS.
BUSBAR (R, W, B & n) AND TRFR TO BUSBAR LV CABLES TO BE RATED AS FOLLOWS.

TRFR (kVA)	RATING (A)
1000	1650

(2) COLOUR CODED P.V.C. WIRE FOR PHASE CONNECTED AUXILIARY WIRING

(3) GREEN P.V.C WIRE FOR EARTH WIRING

(4) BLACK P.V.C WIRE FOR NEUTRAL WIRING

(5) AUXILIARY WIRING TO BE FERRULED AT BOTH ENDS

(6) ALL WIRING INDICATED SHALL BE PROVIDED AND SHALL HAVE SUFFICIENT SLACK TO ALLOW THE METER PLATE TO BE HINGED OUTWARDS TO AT LEAST 90 DEG. RELATIVE TO THE MINI-SUB LV COMPARTMENT.
THE WIRING THAT IS TO BE TERMINATED ONTO THE METERS SHALL BE TAKEN THROUGH THE ø32 HOLES IN THE METER PLATE AND SHALL HAVE AT LEAST 300mm OF EXCESS WIRE WHEN MEASURED FROM THE ø32mm HOLE TO THE WIRE END WITH THE METER PLATE HINGED OUTWARDS.

NOTES:
1. PK2 4-WAY TEST BLOCKS:
   THE CT TEST BLOCK SHALL HAVE SHORTING STRIPS ON THE INCOMING SIDE OF THE CT SUPPLY.
   THE VT TEST BLOCKS SHALL HAVE NO SHORTING STRIPS.
2. METER AND DATA CONCENTRATOR TO BE SUPPLIED BY ESKOM
3. ALL CT WIRING SHALL BE 4mm²
   THE WIRING SHALL BE COLOUR CODED TO REPRESENT THE DIFFFERENT PHASES.
   WIRE NUMBERING SHALL BE AS INDICATED IN THE DIAGRAM
4. THE FUSE HOLDERS SHALL BE MOUNTED ON THE SHORT DIN RAIL
5. THE SURGE ARRESTORS, TERMINALS AND 230V CHANGE OVER RELAY SHALL BE MOUNTED ON THE LONG DIN RAIL

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
8	REVISED METERING WIRING.	J.S.	H. GROENEWALD	H. GROENEWALD	22/11/2023	
7	AMI REQUIREMENTS ADDED	P.A.T.	T.DU PLESSIS	T.DU PLESSIS	24.09.2013	
6	VARIOUS AMMENDMENTS MADE	P.A.T.	B.MWAREHWA	R. KELLY	08.06.2010	

Eskom

AUTH: A. BEKKER
DATE: 07.12.2001
CHKD: G. WHYTE
DATE: 07.12.2001
DRAWN: P.A.VERMAAK
DATE: 09.10.2001

TYPE 'B' MINI-SUBSTATION FOR 11kV + 22kV 1000kVA SCHEMATIC AND WIRING DIAGRAM FOR AUXILIARY EQUIPMENT

SET	SHEET	REVISION
6	6	8

D-DT-0868

A3L