



GEORGE MUNICIPALITY
ELECTROTECHNICAL SERVICES

GEOE STANDARD
NUMBER: GEOE_AB08

**OUTDOOR DISCONNECTORS AND
EARTHING SWITCHES**

**GEORGE MUNICIPALITY ELECTROTECHNICAL SERVICES
 GEORGE STANDARD NO. GEOE_AB08
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Revision	Details	Date	Amended By
0	Standard based on NMBM Std 122 & NRS 031	09-05-2022	

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DEFINITIONS AND ABBREVIATIONS

For the purpose of this specification, the following definitions apply:

Acceptance	Means that the goods shall have been accepted by GM having been: <ul style="list-style-type: none"> • Inspected by the Engineer and found to comply with this specification; • Deliver to the address in George, defined in a purchase order issued by GM; • Received and signed for by an authorised employee of GM on its behalf; and • If appointed, also installed and commissioned as per installation or construction contract.
Approved	Accepted to and approved, in writing, by the Engineer.
Arcing distance	The shortest distance in air external to the insulator between the metallic parts which normally have the operating voltage between them.
Client	George Municipality Electrotechnical Services (GM), local government utility of George, South Africa
Contractor	Contractor appointed to Procure the works as described in this specification.
Disconnecter	A mechanical switching device which provides, in the open position, an isolating distance in accordance with specified requirements.
Document	This complete set of bound conditions, specifications, Bill of Quantities and schedules.
Drawings	Drawings issued with the Tender Documentation.
Earthing switch	A mechanical switching device for earthing parts of a circuit, capable of withstanding for a specified time currents under abnormal conditions such as those of short-circuit, but not required to carry current under normal conditions of the circuit.
Employer	George Municipality, local government, South Africa
Engineer	The person or persons authorised by GM to carry out inspections during manufacture, prior to or after delivery, of the items covered by this specification and acceptance thereof on behalf of the GM and responsible to approve all designs.
Enquiry Document	This refers to a <i>Tender</i> enquiry document, advertised by the employer, for the appointment of a service provider for the supply of equipment or construction works. The terms <i>Tender</i> and <i>Enquiry Document</i> will be used interchangeably.
Install (Installation)	To erect, connect and commission, complete with related accessories.
Installer	An OEM accredited, suitable experienced and qualified contractor or employer responsible for the <i>installation</i> of the works.
Isolator	The term isolator shall refer to disconnecter and vice versa.
Professional Engineer	Professional Engineer registered as a PrEng with the Engineering Council of South Africa (ECSA).
Project Engineer	Same as <i>Engineer</i>
Project Manager	The person or persons authorised by GM to manage the project on behalf of GM Electrotechnical Services
Site	The construction site where the new installation will be installed.
Special tool	Any non-standard tool that is necessary to carry out maintenance on a disconnecter isolator or earthing switch (or both). Such a tool could be for contact-assembly and contact pressure setting, but also for mechanical bearing assembly and disassembly, etc.
Successful Tenderer	The Tenderer appointed as Contractor.

Tender	This refers to a <i>Tender</i> enquiry document, advertised by the employer, for the appointment of a service provider for the supply of equipment or construction works. The terms <i>Tender</i> and <i>Enquiry Document</i> will be used interchangeably.
The Works	Complete, functional installation to be constructed/installed in terms of this Document.
BIL	Basic Insulation Level
ETS	Electrotechnical Services, George Municipality
GM	George Municipality
IP	Ingress Protection
LV	Low Voltage (230V or 400V)
O&M	Operation and Maintenance
OEM	Original Equipment Manufacturer
OHS Act	Occupational Health and Safety Act
SCD	Specific Creepage Distance
SHEQ	Safety, Health, Environmental and Quality

1. INTRODUCTION

This George Municipality Specification, GEOE_AB08, details the specific and general requirements of George Municipality’s Electrotechnical Services Department for 66kV and 132kV alternating current outdoor disconnectors and earthing switches.

2. SCOPE

The “equipment” specified in this specification refers to disconnectors (isolators) as well as earthing switches forming combined units with disconnectors (isolators) or separately mounted earthing switches as applicable. The equipment are used in the utility’s High Voltage Substations as part of a high voltage line bay, transformer bay, bus-section, bus-coupler bays or overhead line disconnecting device. The terminology “disconnectors” and “earthing switches” is mainly used in this standard.

This specification, and applicable reference standards/specifications, must be read in conjunction with the attached technical schedules.

The supply and delivery of the disconnectors and earthing switches shall be detailed in a specific tender document as and when required by the George Municipality, with the technical schedules listing the particulars for the specific tender.

3. STANDARDS AND REFERENCES

3.1. Standards and Codes of Practice

This specification is governed by the latest revision of NRS 031. NRS 031 specify disconnectors and earthing switches in accordance, with SANS 62271-102, except where modified. Where any difference exists between the George Municipality requirements and the NRS and SANS standards, these have been listed in this document. This specification only refers disconnectors and earth switches for use in George Municipality’s outdoor 66kV electrical network. Provision has also been made in the specifications for the provision of 132kV equipment, should the need arise in the future.

All hardware and/or material required for the various equipment components shall comply with the relevant SANS standards. Should SANS standards not be available for a particular element or piece of hardware, the following national and/or international standards shall be complied with and in this sequence of preference:

- NRS
- IEC
- BS

The following non-exhaustive list of documents contain provisions that, whether referenced in the text or not, constitute requirements of this specification. The latest revision will be applicable. It is the responsibility of the Contractor to be familiar with these and other standards.

Note that the National equivalent of IEC standards are generally the same but may include specific variations to be considered. Information on currently valid national standards can be obtained from the South African Bureau of Standards.

Nothing in this specification shall lessen the obligations of the supplier as detailed in any other documents forming part of a specific procurement contract or will relieve the manufacturer of the necessity of the work complying with other relevant standards or recommendations.

George Standards	Std	CoP	Rev.	Rev. Date
Climate, Atmospheric and Environmental Conditions	002		00	Oct 2019
General Construction Requirements	007		00	March 2022

Document Ref	Description
NRS 031	Alternating Current Disconnectors and Earthing Switches
SANS 121 / ISO 1461	Hot-dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods.
SANS 1019	Standard voltages, currents and insulation levels for electricity supply
SANS 1091	National colour standard
SANS/ISO 9001	Quality management systems - Requirements
SANS 10111: Part 1	Engineering Drawing – General Principles
SANS 51706	Aluminium and aluminium alloys – Castings – Chemical composition and mechanical properties
SANS 55015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
SANS 60137	Insulated bushings for alternating voltages above 1 000V.
SANS 60273	Characteristics of indoor and outdoor post insulators for systems with nominal voltages greater than 1 000 V
SANS 60529	Degrees of protection provided by enclosures (IP Code).
SANS 60815: Part 1	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions Part 1: Definitions, information and general Principles
SANS 60815: Part 2	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions Part 2: Ceramic and glass insulators for a.c. systems
SANS 61000-3-2	Electromagnetic compatibility (EMC) Part 3-2: Limits — Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
SANS 61000-3-3	Electromagnetic compatibility (EMC) Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low- voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
SANS 62262	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)
SANS 62271-1	Common clauses for high-voltage switchgear and control gear standards (previous SANS 160694)
SANS 62271-102	Alternating current disconnectors (isolators) and earthing switches
SANS 62271-104	High-voltage switches – Part 104: Alternating current switches for rated voltages higher than 52 kV
SANS 62271-301	Dimensional standardisation of high-voltage terminals
SANS 62384	DC or AC supplied electronic control gear for LED modules - Performance requirements
BS 308	Engineering Drawing Office Practice

3.2. Conditions of Contract

The Conditions of Contract will be specified in the Tender Data.

4. TECHNICAL REQUIREMENTS

4.1. General

The equipment shall comply with the requirements of the relevant standards, the specifications below and the specific requirements as set out in Schedule A of an enquiry document.

The following general design criteria shall be adhered to by the supplier:

1. Disconnectors and Earthing Switches must be fully compliant with NRS 031, unless otherwise stated in this document.
2. The disconnector and/or earthing switch shall be completed with all parts that are necessary or essential for efficient & safe operation. Such parts shall be deemed to be within the scope of supply, whether specifically mentioned or not.
3. All equipment must be operational in the outdoor coastal conditions, which are harsh and corrosive being salt-laden, as stated in GEOE 002.
4. The external insulation creepage for the required insulators has been rationalized to the 'very heavy' pollution class as defined in SANS 60815, specified as a Specific Creepage Distance (SCD) of 31mm/kV of the highest r.m.s phase-to-phase voltage U_m for equipment.
5. Design life minimum: 30 years.
6. This specification is not applicable to disconnectors and earthing switches in metal-enclosed switchgear and control gear. It is also not applicable to pantograph and rocking type disconnectors.

4.2. Design

The type of disconnector required shall be a horizontal single break or a horizontal centre-rotating post double-break with or without a single earthing switch or double earthing switches. The type of disconnector and the number of earthing switches to be fitted will be specified in schedule A of the enquiry document. Details of the disconnector offered shall be stated in schedule B of the enquiry document.

4.3. Phase Clearance

The centre-to-centre phase clearances shall be as follows:

- 66kV - minimum phase spacing = 1,500mm ; ideal phase spacing = 2,000mm
- 132kV - 2,500mm

4.4. Particulars of the Distribution System

1. The disconnectors will be installed on a 3-phase basis, 50Hz system with an effectively earthed neutral.
2. The phase sequence is R-W-B.
3. The required voltage rating and insulation levels are provided in Table 1 below.
4. The minimum equipment's current ratings are provided in Table 2 below.

Table 1: Equipment Voltage Rating and Insulation Levels.

Description / Rating	Value
Nominal Voltage	66 kV
Maximum Continuous Voltage	72.5 kV
Maximum Lightning Impulse withstand Voltage	325 kV
Short duration Power Frequency Withstand	140 kV
Frequency	50 Hz

Refer to SANS 62271-1, Range I, Series I.

It is noted that the insulation levels, i.e. the lightning impulse and short time power frequency levels indicated above are rationalized for altitudes up to 1800m. Although the installations will be done at altitudes below 1000m, the values have been selected for appropriate insulation coordination for altitudes up to 1 800m and must not be corrected for altitude.

Table 2: Equipment Current Rating.

Description / Rating	Value
Rated Continuous Current *	1600 A
Rated short-time withstand rms current (thermal)	25 kA
Rated peak withstand current (dynamic)	62.5 kA
Short Time (Thermal)	3 seconds

Notes:

The nominal continuous rating has been determined based on the requirements of NRS031, although it is double the maximum current of *Bear* conductor.

4.5. Non-motorized and motorised disconnectors and earth switches.

1. Schedule A of the *enquiry document* shall indicate if disconnectors are motorised or non-motorized (hand operated).
2. As a general rule, all disconnector and earth switches shall be non-motorised units, with manual operation.
3. The metal handle or lever shall be operated in the horizontal plane.
4. The length of the handle shall be between 750mm and 1000mm.
5. The output shaft is galvanically connected to the substation earth mat via the support structure by means of a multi-stranded insulated flexible copper conductor of at least 65mm² cross-sectional area.
6. Motorized units may be requested from time to time. This will be specified within the *enquiry document*.
7. Motorized units shall be AC motorized with manual operation when the AC supply is not available.

4.6. Interlocks

The interlocking logic will be implemented through the use of the auxiliary fleeting contacts.

1. Where motorized units are used, interlocking shall be created by way of (hard) wiring. Where applicable, prices shall be given for this option.
2. Where motorized units are used, numeric interlocking (created by using relay logics) may be considered by the Employer, but the written approval of the Employer must be obtained prior to the design stage, should the Contractor wish to exercise this method.
3. Should motorised units be operated manually, whatever interlocking has been created electrically or numerically, shall not be lost, i.e. the same interlocks shall still apply.

4.7. Mounting of disconnectors

1. Disconnectors shall be mounted in the horizontal plane, with the insulators arranged vertically above the bases.
2. Unless otherwise indicated, the support structures will be provided with the disconnectors.

4.8. Main Circuit Requirements

For centre-rotating post double-break disconnectors, a friction entry/exit type contact system is preferred. Contact pressure must be maintained irrespective of mechanical action or small geometric variations.

4.9. Main Terminals

The main terminals, i.e. conductor attachment clamps, shall be aluminium flat pad.

4.10. Auxiliary Switches

4.10.1. General

1. All control elements shall be regular stock items available from standard product lines. The control elements shall be readily interchangeable with an equivalent item from alternative suppliers.
2. The auxiliary contacts shall be rated for 110V DC.
3. Mounting of control elements on access doors is not acceptable practice.
4. All control elements must be labelled with their locations inside the drive.
5. Auxiliary switches shall be driven positively, and the linkage system employed shall ensure correct action throughout the operation.
6. Auxiliary switch contacts shall be galvanically independent.
7. All spare auxiliary switch contacts shall be wired to the secondary terminal strip.
8. Auxiliary switches shall correctly reproduce the main contact position and achieve the relative timing parameters required.
9. The auxiliary switch shall be a fully maintenance free device for the life of the equipment.
10. Switches shall always stay aligned and shall not bend if main contacts become stiff to operate.
11. Auxiliary switches shall not be placed directly under shaft seals where water can enter.

4.10.2. Disconnectors

The following auxiliary switches shall be provided with the disconnectors.

Table 3: Details of auxiliary switches for disconnectors.

Contact Type	Form	Action	No. of Contacts
M	Normally Open	Late Make	4
N	Normally Closed	Early brake	4
D	Fleeting	Early-make late-breaker	2

4.10.3. Earthing Switches

The following auxiliary switches shall be provided with the earth switches

Table 4: Details of auxiliary switches for earth-switches.

Contact Type	Form	Action	No. of Contacts
M	Normally Open	Late Make	2
N	Normally Closed	Early break	2

4.10.4. Auxiliary Switches for Buszone CT Selection

1. When type G and N contacts as per IEC 947-3 are specified, in addition to the requirement for no overlap, there must be a margin between opening of the G contact and closing of the N contact of at least 20% of main contact travel.
2. The successful tenderer must supply test results for the auxiliary switches to prove compliance with this requirement.

4.11. Protection Of Housing and Mechanism Boxes

The terminal box and all hinges, fasteners, handles, etc, shall be of stainless steel.

4.12. Greasing of Main Contacts

Main contacts of both disconnectors and earthing switches shall be greased using **CONTREP** or an approved equivalent, recommended by the OEM.

4.13. Spares and Special Tools

Tenderers shall quote separately for any spares that are recommended and any special tools required for the installation and maintenance of the equipment.

5. SUPPORT STRUCTURES

If required in the enquiry document, the *Contractor/Supplier* shall provide suitable galvanised steel structures for the disconnectors and earthing switches to be installed on, with the following minimum requirements:

1. The support structures shall be of a lattice steelwork design.
2. All metalwork, bolts, nuts, washers, etc., shall be hot-dip galvanised after fabrication in accordance with SANS 121.
3. Steel shall be in accordance with SANS 1431;
4. Steel shall be Grade 350W;
5. Welding shall conform to the requirements of SANS 10044;
6. Welds shall be seal welded;
7. Steelwork shall be fabricated, erected and levelled to a tolerance of $\pm 1.5\text{mm}$;
8. Bolts and nuts shall be in accordance with SANS 1700:5;
9. Bolts and nuts shall be Grade 8.8;
10. Holes shall have diameter of 18mm for M16 bolts.

6. INSPECTIONS AND TESTS

The following requirements must be met with regards to inspections and tests of the equipment:

1. Equipment will have to be type tested as prescribed by NRS 031 and certified copies of type tests certificates must be provided.
2. Test certificates for routine test as prescribed by NRS 031 must be submitted for approval prior to delivery of equipment.
3. The test reports shall be issued by SANS or IEC accredited test authority.
4. George Municipality reserves the right to carry out inspections of the manufacturing facility and attend testing of products upon approval.
5. Even if a unit has been type tested, George Municipality reserves the right to test the product unit in accordance with any of the tests contained in NRS 031 before it is put to service. George Municipality will evaluate the proposed changes and if the manufacturer does not comply with the specification the *Contractor* shall be instructed to redo the relevant type tests at his own cost.

7. MARKING AND LABELLING

Except as specified otherwise, the marking and labelling shall comply with NRS 031 and shall be to the approval of the Municipality. The following additional requirements must be noted:

1. The open and close positions shall be positively identified at the mechanism with labels "ON" and "OFF" respectively.
2. The direction in which to achieve open is clearly indicated.

8. DOCUMENTATION

8.1. General

The following documentation and drawings shall be provided by the supplier:

1. Technical product catalogue and installation, operating and maintenance manuals shall be provided in triplet copy and soft copy prior to delivery.
2. A copy of all type test reports shall be provided.
3. A copy of the proposed routine test reports shall be provided.
4. The language used for labels, drawings, certificates and manuals, shall be in English.
5. Refer to all requirements as set out in NRS 031.

8.2. Drawings

Full detailed dimensions drawings shall be provided and must adhere to the following:

1. The original drawings shall be prepared in such a manner that they comply fully with the requirements of SANS 10111 and BS 308 in order that acceptable microfilm versions can be made from them.
2. Drawings in CAD format are preferred. Where CAD drawings are available, the successful tenderer shall submit drawings in electronic form when called upon to do so.

9. TRANSPORT, PACKAGING AND DELIVERY

1. Equipment to be delivered to George, Western Cape.
2. All equipment will be properly packaged in robust wooden crates and will be packed and supported in such a way that damage cannot occur during normal handling.
3. All crates will enable inspection to take place without damaging the crates.
4. Crates will have clearly marked lifting hooks.
5. Crates will not degrade completely when exposed to rain and sunlight for a period of 18 months.
6. All crates shall be properly marked to indicate the contents and unique identifiers of the contents contained within.

10. QUALITY

10.1. General

All materials and equipment supplied and / or installed in terms of this Specification shall adhere to the following:

1. All materials and equipment shall be new and in fully merchantable condition.
2. Workmanship shall be of a professional standard carried out by qualified and skilled tradesmen / women to the satisfaction of the Engineer.
3. Normal accepted industry expertise is expected throughout.

10.2. Quality Assurance Provisions

The Tenderer will be required to submit documentary proof of his quality control process or whether his firm is listed by the South African Bureau of Standards as a firm whose quality management system complies with SANS ISO 9000, Quality Systems, in respect of products covered by this contract.

11. GUARANTEE

1. All equipment offered shall have an unconditional manufacturer's guarantee with a minimum period of five years from date of delivery.
2. If equipment are found to have failed within this period as a result of poor manufacturing processes and/or poor materials it shall be replaced free of charge by the manufacturer.
3. Equipment that are to be replaced shall be collected from George Municipality and replaced within the delivery date stated by the Tenderer in the *Enquiry Document* at the cost of the contractor appointed to supply the specific equipment.

Annex A – Technical Schedules : 66kV 1600A Disconnectors & Earthing Switches

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	NRS Sub-clause	Description	Schedule A	Schedule B	
1	1.3	Service condition			
		a) Altitude up to	m	1000	_____
		b) Ambient temperature	Max °C	40	_____
			Min °C	-5	_____
		c) Relative humidity	Max %	95	_____
		d) Level of pollution		Very Heavy	_____
		e) Special Conditions:			_____
1) Lightning area	Yes/No	Yes	_____		
2) Flash density according to SANS 10313	/km ² /year	1.5	_____		
2	4.2.2	Disconnecter Ratings			
		a) Rated voltage	kV	72.5	_____
		b) Number of phases		3	_____
		c) Rated continuous primary current		1600	_____
		d) Rated short-time withstand rms current (thermal)	kA	25	_____
		e) Rated peak withstand current (dynamic)	kA	62.5	_____
		f) Short-time withstand current duration	s	3	_____
		g) Power frequency short-duration withstand voltage	kV	140	_____
		h) Lightning impulse withstand	kV	325	_____
3	4.4	Earthing Switch Ratings			
		a) Rated voltage	kV	72.5	_____
		b) Rated short-time withstand rms current (thermal)	kA	25	_____
		c) Rated peak withstand current (dynamic)	kA	62.5	_____
		d) Short-time withstand current duration	s	3	_____
4	4.2.1	Type of disconnectors required			
		a) Type of disconnectors required		Centre rotating post double break	_____
		b) Is an earthing facility required?		No	_____
		c) If yes, single or double earthing switch			_____
		d) Method of operation of disconnectors		Hand operated	_____
e) Method of operation of earthing switch		Hand operated	_____		

Annex A – Technical Schedules : 66kV 1600A Disconnectors & Earthing Switches

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	NRS Sub-clause	Description	Schedule A	Schedule B	
5	4.2	Details of disconnectors			
		a) Disconnecter to comply with George Electrotechnical Standard GEOE_AB08 and NRS 031	Yes/No	Yes	_____
		b) Manufacturer name and address		xxxxxxxxxx	_____ _____ _____
		c) Manufacturer type designation		xxxxxxxxxx	_____
		d) number of breaks		2	_____
		e) Orientation of rotating blade		Horizontal	_____
		f) isolating distance	mm	xxxxxxxxxx	_____
		g) main contacts			
		1. entry		friction	_____
		2. type		xxxxxxxxxx	_____
4.2.17		h) Details of measures taken to prevent corrosion of the main current path components and entire mechanical system,		xxxxxxxxxx	_____ _____ _____
		i) Are spark gaps and arcing horns required for disconnectors?		No	xxxxxxxxxx
6	4.2	Details of earthing switches			
		a) Earthing switch to comply with George Electrotechnical Standard GEOE_AB08 and NRS 031	Yes/No	Yes	_____
		b) Manufacturer name and address		xxxxxxxxxx	_____ _____ _____
		c) Manufacturer type designation		xxxxxxxxxx	_____
		d) number of breaks		1	_____
		e) Orientation of rotating blade		Vertical	_____
		f) isolating distance	mm	xxxxxxxxxx	_____
		g) main contacts			
		1. entry		xxxxxxxxxx	_____
		2. type		xxxxxxxxxx	_____

Annex A – Technical Schedules : 66kV 1600A Disconnectors & Earthing Switches

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	NRS Sub-clause	Description	Schedule A	Schedule B
	4.2.17	3. contact force 4. materials 5. wear allowance h) Details of measures taken to prevent corrosion of the main current path components and entire mechanical system,	N XXXXXXXXXX XXXXXXXXXX XXXXXXXXXX XXXXXXXXXX	_____ _____ _____ _____
7	4.3	Mounting of disconnectors and support structures a) upright, horizontal or vertical b) phase spacing (min) mm c) arrangement of phases, in-line or transverse d) is a support structure to be provided? e) If yes: 1. minimum mounting height (lowest part of insulator above ground level) mm 2. are necessary fixing bolts, shims, etc., to be provided? f) Is earthing facilities required on structures (earth ball one per structure)	horizontal 1,500 In-line No, installed at high level on gantry beam 2,500 Yes Yes	_____ _____ _____ XXXXXXXXXX _____ _____ _____
8	4.4.2	For hand operation (non-motorised) a) horizontal or vertical movement offered? b) are special interlocking facilities required? c) If yes, details	Horizontal Yes/No _____	_____ _____ _____
9	4.4.3 4.4.2(c) 4.4.2(d)	For electric motor operation a) control voltage V b) rated power W c) starting current A d) alternative control switch labelling e) are special interlocking arrangements required? f) If yes, details g) Is Local/Off/Remote switch required.	_____ XXXXXXXXXX XXXXXXXXXX _____ No _____ Yes/No	_____ _____ _____ _____ _____ XXXXXXXXXX _____
10	4.9	Auxiliary switches		

Annex A – Technical Schedules : 66kV 1600A Disconnectors & Earthing Switches

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	NRS Sub-clause	Description	Schedule A	Schedule B
		2. across the isolating distance kV	160	_____
16	4.20.2	Special tools required	XXXXXXXXXX	_____ _____ _____
17	5	Tests a) Are type test result certificates available? <i>If type tests are not available, the proposed product can be deemed non-compliant by the employer.</i>	Yes	_____ _____
	5.1.1	b) What type test certification for similar equipment is available?	XXXXXXXXXX	_____ _____
	5.1.5	c) Period and value for short-time current test s	XXXXXXXXXX	_____
18	6	Marking/labelling/documentation		
		a) language(s) for labels, drawings, certificates and manuals	English	_____
		b) Structural drawings enclosed	Yes	_____
		c) number of instruction manuals required	3	_____
		d) Materials used for rating plates	Stainless steel	_____
		e) Materials used for diagram plates	Stainless steel	_____
f) Method of fixing diagram and rating plates	XXXXXXXXXX	_____		
19	4.2.1	Mass details		
	4.2.1.1	a) complete disconnector without earthing switch kg	XXXXXXXXXX	_____
	4.2.1.1	b) complete disconnector with single earthing switch kg	XXXXXXXXXX	_____
	4.2.1.1	c) complete disconnector with double earthing switches kg	XXXXXXXXXX	_____
	4.2.1.2	d) separate earthing switch kg	XXXXXXXXXX	_____
20		Delivery Time	XXXXXXXXXX	_____