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NPS/002/028 – Technical Specification for Double Pole and Four Pole Isolation Switches

1. Purpose

The purpose of this specification is to detail the specific technical requirements of Northern Powergrid (the Company) in relation to double and Four pole isolation switches for use on the companies' network.

This document supersedes the following documents, all copies of which should be destroyed;

Document Reference	Document Title	Version	Published Date
NPS/002/028	Technical specification for double and Four pole isolation switches	1.2	March 2017

2. Scope

This document describes the Company's requirements for the supply of double pole (phase and neutral) isolation switches rated 230V, 100A and four pole (three phase and neutral) isolation switches rated 400V, 100A used as a means of isolation between the consumers domestic distribution unit and the meter operators metering unit. The unit shall normally be located either within an outdoor meter cabinet or mounted on a meter board internal to the property.

The following appendices form part of this technical specification:

- Appendix 1 – Product requirements,
- Appendix 2 - Logistical requirements,
- Appendix 3 - Self certification conformance declaration,
- Appendix 4 - Addendum to supplier requirements,
- Appendix 5 – Pre-commission testing, routine inspection and maintenance requirements, and
- Appendix 6 - Technical information check list.

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3. Technical Requirements

3.1. Isolation Switches

Northern Powergrid shall not generally provide an isolator switch for new connections, unless otherwise requested by the customer and agreed by Northern Powergrid. On direct request from the customer an isolation switch may be installed post-installation, although this service should preferably be provided by the customers Supplier/Meter Operator.

Isolation switches may be installed by Northern Powergrid at the request of the customer on existing installations (e.g. If Northern Powergrid are requested to temporarily de-energise a connection).

The isolation switch shall be inserted between the meters and customers equipment and isolates both phase(s) and neutral. The isolation switch shall not, under any circumstance, be installed between the service cable cut out and meter.

3.2. Enclosure

The enclosure shall be manufactured from a non-hygroscopic, insulated and flame retardant material capable of providing a high impact resistance. With the isolators in place this unit shall provide a min IP3XC rating or above in accordance with BS EN 60529:1992 + A2:2013.

The back-plate shall be one piece with two or four x 4mm diameter holes for mounting screws.

The switch shall be mounted on a DIN RAIL within the enclosure. Access to the incoming live and neutral terminals shall be by the removal of a detachable front cover which shall be held in situ by two fitted captive screws.

Only the outgoing terminals shall be accessible to the customer and to restrict access to the incoming terminals, provision must be provided for the sealing of the front cover to the back plate.

The outgoing customer terminal cover plate shall be clearly marked with the warning embossed, engraved or other permanent means: "Switch off before removing cover".

To alleviate the possibility of incorrect installation the cover shall be marked LN – In and LN – Out.

Incoming and outgoing terminals shall be covered with colour coded mechanical shrouds to prevent inadvertent contact.

The incoming and outgoing ports of the enclosure shall be suitable for accepting single core 25mm² double insulated cables. Rubber grommets shall be provided to accommodate single core 16mm² double insulated cables.

The enclosure shall be supplied complete with a removable insulated blanking plate which prevents inadvertent contact with the outgoing terminals until such time as the outgoing cables have been secured in place.

The enclosure shall include two(single phase) or four(three phase) manually operated single pole switch-disconnector's, ganged, to provide double(single phase) or four(three phase) pole isolation. The switch-disconnectors shall be mounted within the enclosure to ensure the following arrangement of Neutral - Live (left to right) viewed from the front of the unit.

3.3. Mechanical Switch-Disconnecter

The switch-disconnector shall have a utilization category AC22A at a rated operational current of 100A at 230V/400V - 50Hz and a conditional short-circuit rating of 16kA or short-circuit performance capability of 2kA/1 second type tested to BS EN 60947-3:2009 + A2:2015.

The actuator (operating handle) of the switch-disconnector shall have a positive ON/OFF indication and to be made of an insulating material and coloured Brown - Live and Blue - Neutral.

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3.4. Terminals

The incoming and outgoing terminal bores shall be capable of accepting 16mm² to 25mm² double insulated single core stranded or tri rated copper conductor using cable clamping screws with flat ends and rifled terminals or rifled clamps.

The terminals shall be designed to ensure that the necessary contact pressure corresponding to the current rating and the short-circuit strength of the apparatus and the circuit is maintained.

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4. References

4.1. External Documentation

The products described within this specification shall comply with the relevant International Standards, British Standard Specifications and all relevant Energy Networks Association Technical Specifications (ENATS) current at the time of tendering, except where varied by this standard. In respect the following documents are particularly relevant.

Reference	Version/Date	Title
BS EN 60529:1992 + A2:2013	1992	Degrees of protection provided by enclosures (IP code)
BS EN 60947-3:2009 + A2:2015	2009	Low-voltage switchgear and control gear. Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units

The supplier shall provide with the tender full technical details of the equipment offered and shall indicate any divergence from these standards or specifications.

4.2. Internal Documentation

Reference	Title
n/a	

4.3. Amendments from Previous Version

Reference	Description
3. Technical Requirements	<ul style="list-style-type: none"> * Additional – 3.1 Isolation Switches information * Additional requirement for outgoing customer terminal cover plate * Additional requirements for 3-phase 4-pole isolation switches * Remove exacting isolation switch dimensions * 3.2 Enclosure – Change IP rating from IP57 to IP3XC * 3.3 Mechanical Switch-Disconnector - as 'conditional short-circuit rating' information not mandatory, additional 'short-circuit performance capability' added as per BS EN 60947-3:2009 + A2:2015
6. Authority for Issue	* Additional internal approval
Appendix 1 – Product Requirements	* Additional 3-phase 4-pole isolation switch
Appendix 3 – Self Certification Conformance Declaration	<ul style="list-style-type: none"> * Change to heading - NPS/002/028 – Technical Specification for Double and Four Pole Isolation Switches * Added BSEN 60947-3:2009 + A2:2015 test requirements - 5.2.4 (a to g), 8.3.6 and(or) 8.3.5
NPS/002/028	* Additional 3-phase 4-pole isolation switch requirement

5. Definitions

Term	Definition
BS EN 60947-3 Category AC22A	Switching of mixed resistive and inductive loads including moderate overloads
DIN	Deutsches Institute Fur Normung (German Institute for Standardisation)
Non-hygroscopic	Describes a material or compound lacking the property of absorbing and retaining an appreciable quantity of moisture from the air
The Company	Northern Powergrid

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6. Authority for Issue

6.1. CDS Assurance

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

		Date
Liz Beat	Governance Administrator	21/11/2022

6.2. Author

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

Review Period - This document should be reviewed within the following time period;

Standard CDS review of 3 years?	Non Standard Review Period & Reason	
No	Period: 5 Years	Reason: Update will be dictated by contract renewal date or any significant changes in the specification or documents referenced.
Should this document be displayed on the Northern Powergrid external website?		Yes
		Date
Paul Hanrahan	Engineer – Asset Management	28/11/2022

6.3. Technical Assurance

I sign to confirm that I am satisfied with all aspects of the content and preparation of this document and submit it for approval and authorisation.

		Date
Steve Salkeld	Policy & Standards Engineer	21/11/2022
Joe Helm	Policy & Standards Manager	06/12/2022

6.4. Authorisation

Authorisation is granted for publication of this document.

		Date
Paul Black	System Engineering Manager	21/12/2022

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Appendix 1 – Product Requirements

Description	Commodity Code
Service Switch, Double Pole, Isolating, 100Amp	188031
Service Switch, 3 Phase 4-pole, Isolating, 100Amp	188032

Supporting evidence of compliance with type tests shall be submitted with the completed tender document.

Manufacturers may provide alternative tenders for items not complying with the above specification. This shall be clearly stated together with detailed descriptions of any variation from the specification, together with drawings and test results.

The supplier shall provide with the tender full technical details of the equipment offered and shall indicate any divergence from these standards or specifications.

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Appendix 2 – Logistical Requirements

To enable the Company to store the product(s) in accordance with the manufacturer’s recommendations the Tenderer shall provide details of the recommended storage environment with respect to each tendered product.

Details shall be provided where relevant, in respect of the minimum and maximum exposure levels, frequency of exposure and duration of exposure of the packaged item with respect to;

- Ambient temperature
- Atmospheric corrosion
- Humidity
- Impact
- Water
- Vibration
- Dust
- Solar radiation

The Tenderer shall ensure that each item is suitably packaged and protected to enable storage in an outdoor environment whilst maintaining the product and packaging as “fit for service” prior to installation.

All packaging shall be sufficiently durable giving regard to the function, reasonable use and contents of the packaging. Where product packages tendered are made up of sub packages all the sub packages shall unless varied by this specification, be supplied securely packaged together. Where items are provided in bagged/boxed form the material from which the bags are manufactured shall be capable of sustaining the package weight and resisting puncture by the materials within.

Tenderer shall submit at the time of tendering the details of the proposed packaging (i.e. materials composition and structure) to be used for each product. Where the Tenderer is unable to provide packaging suitable for outdoor storage then this should be stated at the time of tender.

In order to maximise storage space all palletised goods shall be supplied in standard returnable box pallets with the following specification. Where applicable, suppliers shall also indicate the maximum number of units of each product that are storable per box pallet.

- Size - 1200mm (w) x 1000mm (d) x 750mm (h)
- Weight (empty) – Up to 33kg
- Load Capacity – Up to 450kg
- Maximum Stacking Capacity – 10 High

Suppliers shall also include details of the type of material used to manufacture the box pallets.

The Company will give consideration to innovative alternatives to this specification.

Clearly legible, easily identifiable, durable and unambiguous labelling shall be applied to each individual and where relevant, multiple package of like products. Where products packages tendered are made up of sub packages each sub packages shall be marked. As a minimum requirement the following shall be included;

- Manufacturer’s trademark or name
- Supplier’s trademark or name
- Description of item
- Date of packaging and/or batch number
- Northern Powergrid product code
- Weight

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- Shelf Life

Tenderer shall submit at the time of tendering a sample of the proposed labelling for each product package type.

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Appendix 3 – Self Certification Conformance Declaration

The products described shall comply with the latest issues of the relevant national and international standards. Additionally this technical specification is intended to amplify and/or clarify requirements relating to these Standards.

This self-declaration sheet identifies the clauses of the aforementioned standards relevant to double pole isolation switches for use on the Company distribution network. The manufacturer shall declare conformance or otherwise, clause by clause, using the following levels of conformance declaration codes.

Conformance declaration codes

N/A = Clause is not applicable/ appropriate to the product

Cs1 = The product conforms fully with the requirements of this clause

Cs2 = The product conforms partially with the requirements of this clause

Cs3 = The product does not conform to the requirements of this clause

Cs4 = The product does not currently conform to the requirements of this clause, but the manufacturer proposes to modify and test the product in order to conform.

Manufacturer / Supplier:

Manufacturer / Supplier Product Reference:

Northern Powergrid Product Reference (Commodity Code):

Details of the Product Type: (e.g. Voltage, Conductor Type and Size)

Name:

Signature:

Date:

NOTE: One sheet shall be completed for each type of cable offered.

Instructions for Completion

- When Cs1 code is entered the supplier shall provide evidence to confirm conformance.
- When any other code is entered the reason and supporting evidence for non - conformance shall be entered.
- Prefix each remark with the relevant 'BS EN' 'IEC' or 'ENATS' as appropriate.
- Provide technical data sheets and associated drawings for each product.

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Clause/Sub-clause	Clause / Requirements	Conformance Code	Evidence Reference	Remarks / Comments
NPS/002/028: 3.2. Mechanical Switch-Disconnecter	Utilization Category AC22A			
	Positive ON – Off Indication			
	Conditional Short Circuit Rating 16kA(if not stated 8.3.5 test sequence III)			

BSEN 60947-3:2009 + A2:2015 – Low-voltage switchgear and control gear. Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units				
Clause/Sub-clause	Clause / Requirements	Conformance Code	Evidence Reference	Remarks / Comments
5.2.3 (a)	Terminals identification			
5.2.4 (a to g)	Manufacturers published information/Data			
7.2.4	Ability to make and break under no-load, normal-load, and overload conditions			
7.2.5	Ability to make, break or withstand short circuit currents			
8.1.2	Type Tests			
8.3.6	Test sequence IV: conditional short-circuit current			
or				
8.3.5 (test sequence III)	Value of rated conditional short-circuit current is not stated by the manufacturer and test sequence III is carried out			

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Appendix 4 – Addendum to Supplier Requirements

To enable the Company to install the product(s) in accordance with the manufacturer’s recommendations, if appropriate, the supplier shall provide a single copy of drawings, descriptive leaflets and instruction manuals appropriate to the goods being offered, which shall incorporate details of the recommended installation procedures required in order to provide optimal performance of the goods during their operational life.

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Appendix 5 – Pre-Commission Testing, Routine Inspection and Maintenance Requirements

Suppliers shall provide details of the recommended pre-commission testing and inspection required.

They shall also provide information regarding periodic inspection and maintenance requirements to be undertaken during the lifetime of their product.

Detailed inspection and maintenance instructions shall also be provided.

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Appendix 6 – Technical Information Check List

The following information shall be provided by the supplier for technical review by Northern Powergrid. Additional information shall be provided if requested.

Requirement	Provided (Y/N)
Full product descriptions and part number/reference	
Appendix 3 – completed self-certification conformance declaration	
Complete set of drawings for each variant	
Type test evidence	
Routine test plan (example)	
Pre-commissioning testing/inspection requirements	
Recommended periodical inspection and maintenance requirements	
Packaging/delivery information	