

1 SCOPE

This document lists the types of New Surge Arresters that are currently PowerSystems Approved or being considered for Approval for connection to the Company network.

It covers Equipment types with rated voltages from 12kV up to 420kV.

2 ISSUE RECORD

This document is controlled maintained.

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DATE	ISSUE NO	AUTHOR	AMENDMENT DETAILS
November 2001	1	David Kilday	Initial Issue
April 2004	2	Mark Godding	Addition of Review and Glossary Section, Equipment Approval Categories revised, Approval Categories of listed equipment revised. Inclusion of S2 arrester for G78 mobile telephone base stations.

3 ISSUE AUTHORITY

Author	Owner	Issue Authority
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4 REVIEW

This document shall be subject to annual review or more frequently if New surge arrester types receive PowerSystems Approval.



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6 GLOSSARY

Approved:	Equipment which is approved in accordance with PowerSystems documents for use or installation on the Company network.
Company:	Refers to SP Distribution plc, SP Transmission plc and SP Manweb plc.
Equipment:	Switchgear, transformers, cables, overhead lines, surge arresters, voltage transformers, current transformers, unit substations.
New:	Approved equipment which has not previously been connected to the system and which has been routine tested in a Manufacturing Facility with a Quality Management System in accordance with the relevant standard prior to delivery.
PowerSystems:	SP PowerSystems Ltd, operator of network assets on behalf of the Company.
SP Distribution Ltd:	The Distribution Licence Holder for the distribution service area formally known as ScottishPower.
SP Transmission Ltd:	The Transmission Licence Holder for the transmission service area formally known as ScottishPower.
SP Manweb plc:	The Distribution Licence Holder for the distribution service area formally known as Manweb.
G78:	Recommendations for Low Voltage connections to mobile telephone base stations with antennae on High Voltage structures.

7 REFERENCES

7.1 Scottish Power Technical Specifications

EPS-03-012 (Previously 4389/10.001)
Metal Oxide Surge Arresters (3.6 to 420kV).

EPS-03-013 (Previously 4391/10,000)
Metal Oxide Surge Arresters (11 and 33kV).

7.2 International Electrical Commission Specifications

IEC 60060-1
High Voltage Test Techniques Part 1: General Definitions and Test Requirements.

IEC 60099-4
Surge Arresters Part 4: Metal Oxide Surge Arresters without Gaps for AC Systems.

IEC 60815
Guide for the Selection of Insulators in Respect of Polluted Conditions.

IEC 61109
Composite Insulators for AC Overhead Lines with a Nominal Voltage Greater Than 1000V - Definitions, Test Methods and Acceptance Criteria.

8 STANDARD REQUIREMENTS

Transmission surge arresters are required to meet Scottish Power Technical Specification EPS-03-012 (Previously 4389/10,001).

Distribution surge arresters are required to meet Scottish Power Technical Specification EPS-03-013 (Previously 4391/10,000).

Reference should also be made to IEC 60060-1, IEC 6099-4, IEC 60815 & IEC 61109.

9 EQUIPMENT APPROVAL CATEGORIES

All surge arrester equipment in this part of the Approved Equipment Register have been assigned particular approval categories. The categories are defined below:

Prior to any Equipment being installed on the Company network it shall have obtained an appropriate PowerSystems Approval, which shall be either category 'A' 'P' or 'S'. Please note that Equipment designated with a category 'R', is not PowerSystems Approved and shall not be installed on the Company network prior to gaining a suitable, 'A' 'P' or 'S', Approval category.

- (i.) **Category P (Provisional)** – Category P Equipment has had a preliminary assessment carried out and appears suitable for connection to the Company network. The provisional designation implies that the Equipment is anticipated to receive either Category A or Category S Approval in future, upon completion of the PowerSystems, Equipment Approval Procedure, Asset-02-002. Plant or equipment in this category can be offered against contracts but requires confirmation from the Engineering and Transmission Operations manager, or his nominated representative that the Equipment is suitable for connection to the Company network.
- (ii.) **Category S** – Category S Equipment has been approved **only** for a specific contract or site. Plant or equipment in this category can be offered against contracts but requires confirmation from the Engineering and Transmission Operations manager, or his nominated representative that the Equipment is suitable for connection to the Company network.
- (iii.) **Category R** – Category R Equipment has been either NGC Type Registered or EA Switchgear Panel Assessed, but has not formally been PowerSystems Approved for installation on the Company network. This Equipment may be suitable for installation, but will require to be Approved or gaining Approval, in accordance with PowerSystems document Asset-02-002, prior to installation on the Company network. Plant or equipment in this category can be offered against contracts but requires written confirmation from the Engineering and Transmission Operations manager, or his nominated representative that the Equipment is deemed suitable for PowerSystems Approval prior to the placement of a procurement contract to purchase the Equipment for installation on the Company network.
- (iv.) **Category A** – Category A Equipment is fully Approved in accordance with the PowerSystems, Equipment Approval Procedure, Asset-02-002. and is suitable for installation on the Company network.



10 APPENDICES

7.1 420kV GIS Surge Arresters

Manufacturer	Type	IEC Rating	Discharge Class	Approval Cat	Remarks	ScottishPower Part Number
ABB Hochspannungs-technik AG Wettingen Switzerland	ELK-AZ-32A-288	20 kA	5	A		N/A



7.2 300kV GIS Surge Arresters

Manufacturer	Type	IEC Rating	Discharge Class	Approval Cat	Remarks	ScottishPower Part Number

7.3 145kV GIS Surge Arresters

Manufacturer	Type	IEC Rating	Discharge Class	Approval Cat	Remarks	ScottishPower Part Number
ABB Hochspannungs-technik AG Wettingen Switzerland	ELK-AZ-14A-106	10 kA	3	P	MAA7H46GGA block Outline drawing Nos. HAWA380218 & HAWA100267	N/A
	ELK-AZ-01A-106	10 kA	3	P	3 phase tank. MAA7H46GGA block Outline drawing Nos. HAWA380237 & HAWA100273	N/A



7.4 420kV AIS Surge Arresters

Manufacturer	Type	IEC Rating	Discharge Class	Approval Cat	Remarks	ScottishPower Part Number
ABB Power Ltd Ludvika	EXLIM P396-EH420E 2 - Element, S/C - 50kA	20 kA	4	P	Ref drawing No 5680 1672-G Cemented flanges are used giving increase in cantilever strength of 50% and tortional strength of 300%	N/A
Bowthorpe EMP Ltd Brighton	4P10S360	20 kA	4	P	Modular design utilises “polymeric” Ethylene Propylene Diene Monomer (EPDM) insulation material. Harris Semiconductor IRGZ4142 (φ42mm, H42mm) ZnO disks. Outline drawing No LA-11037.	N/A
	4P10S36OL2EM6N	20 kA	4	P	Modular design utilises Silicone Rubber Insulation material and star bar inter column support Drawing.No. LA-11297	N/A
Alstom Villeurbanne	PSB360Z	20kA	4	P	Minimum creepage 11090mm Pressure relief 50kA in 0.2s	N/A

7.5 300kV AIS Surge Arresters

Manufacturer	Type	IEC Rating	Discharge Class	Approval Cat	Remarks	ScottishPower Part Number
ABB Power Ltd Ludvika	EXLIM P264-DH300E	20 kA	4	P	Ref drawing No 5680 1415-AG. This is a replacement of the previous design type XAP300C3/264, which has been fully approved since 1988	N/A
	EXLIM P264-BH300E	20 kA	4	P	Ref drawing No 5680 1529-AJ. This “P-B” version has the same electrical duty as the “P-D” version but it has a different mechanical (a smaller diameter porcelain house) characteristic than the “P-D” version	N/A
	EXLIM P264-EH300E	20 kA	4	P	Ref drawing No 5680-1672H. Cemented flanges are used giving increase in Cantilever strength of 50% and torsional strength of 300%.	N/A

7.5 300kV AIS Surge Arresters (cont.)

Manufacturer	Type	IEC Rating	Discharge Class	Approval Cat	Remarks	ScottishPower Part Number
ABB Power Ltd Ludvika	PEXLIM Q264-XV300E & HE	10 kA	3	A	Ref drawing No. 5860 2006E-C.	N/A
Bowthorpe EMP Ltd. Brighton	4P8S260	20 kA	4	P	Modular design utilises “polymeric” Ethylene Propylene Diene Monomer (EPDM) insulation material. Harris Semiconductor IRGZ4142 (φ42mm, H42mm) ZnO disks. Outline drawing No LA-11037	N/A
	4P8S260L2E2M6N	20 kA	4	P	Modular design utilises Silicone Rubber Insulation material and star bar inter column support. Drawing No. LA-11298	N/A
Siemens Berlin	3EQ260-2PZ3	20kA	3	P	Ref drawing No. 3HH.802.58671, uses slilcone rubber sheds.	N/A
Alstom Villeurbanne	PSB260Z	20kA	4	P	Minimum creepage 8370mm Pressure relief 50kA in 0.2s	N/A

7.6 145kV AIS Surge Arresters

Manufacturer	Type	IEC Rating	Discharge Class	Approval Cat	Remarks	ScottishPower Part Number
ABB Power Ltd Ludvika	EXLIM P132-AH145E	20 kA	4	P	Ref drawing No 5680 1524-F. This is a replacement of the previous design type XAP145AS/132, which has been fully approved since 1988	N/A
	EXLIM Q132-AH145E	10 kA	3	P	Ref drawing No 5680 1524-F. This is an alternative of ExlimP132-AH145E for less demanding applications. Potential applications must be referred to ET	N/A
	PEXL1MQ-Q132XV145E & HE	10 kA	3	A	Ref. Drawing XL 300 024-724 Ur – 120kV Uc – 92kV	N/A
Bowthorpe EMP Ltd., Brighton	4P4S132	20kA	4	P	Modular design utilises “polymeric” Ethylene Propylene Diene Monomer (EPDM) insulation material. Harris Semiconductor IRGZ4142 (φ42mm, H42mm) ZnO disks Outline drawing No LA-11037	N/A
	4P4S132L -2E2M6N	20kA	4	P	Modular design utilises Silicone Rubber Insulation material and star bar inter column support. Drg No. LA-11299	N/A
Alstom Villeurbanne	PSC132YL	10 kA	3	P	Outline drawing No DA06844. (No stress ring fitted).	N/A

7.7 36kV Surge Arresters

Manufacturer	Type	Rated Voltage	Remarks	ScottishPower Part Number
Cooper Power Systems	VARISTAR UHS3313LLB*0AA*	36kV	10kA line discharge. 100kA high current impulse.	C39880011
INAEL	DT.3.027.UK.F	36kV		

7.8 12kV Surge Arresters

Manufacturer	Type	Rated Voltage	Remarks	ScottishPower Part Number
Cooper Power Systems	VARISTAR UHS1206S3H40AAL	12kV	10kA line discharge. 100kA high current impulse.	C39900162
INAEL	DT.3.020.UK.E	12kV		

7.9 G78 S2 Surge Arresters

Manufacturer	Type	Rated Voltage	Remarks	ScottishPower Part Number
Cooper Power Systems	VARIGAP UHG1808LLH30AAA	18kV	30.6kV TOV, Residual Voltage 47.1kV 10kA line discharge. 100kA high current impulse.	C39880012