



## 1 SCOPE

This document lists the types of New electrical switchgear and associated Equipment that are currently PowerSystems Approved or being considered for Approval for connection to the Company network.

This document does not include electrical switchgear types that have been previously Approved for connection to the Company network, which although still suitable for service, are now considered unacceptable for New installations.

It covers Equipment types with rated voltages from LV up to 420kV. Equipment may be ground mounted or pole mounted as detailed in the appropriate table.

## 2 ISSUE RECORD

**This document is a controlled maintained document.**

**All copies printed via the Intranet or photocopied will be deemed uncontrolled.**

<b>Issue Date</b>	<b>Issue No.</b>	<b>Author</b>	<b>Amendment Details</b>
Dec 2001	1	Kevin Butter	Initial Issue
Jan 2003	2	Alastair Graham	Approval categories revised
Apr 2005	3	Mark Godding	Additional Equipment Added Additional Category of LV Service Distribution Boards for Multiple Occupancy Premises.

## 3 ISSUE AUTHORITY

<b>Author</b>	<b>Owner</b>	<b>Issue Authority</b>
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## 4 REVIEW

This document shall be subject to annual review or more frequently if New switchgear 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 Ltd, SP Transmission Ltd 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 Power Systems 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.



## **7 REFERENCES**

It is important that users of the documents listed below ensure that they are in possession of the latest issue of the documents together with any amendments.

### **7.1 PowerSystems Documents**

Asset-02-002 PowerSystems, Equipment Approval Procedure

### **7.2 PowerSystems Technical Specifications**

SWG-03-020 Specification for 36kV Indoor Circuit Breakers & Switch Disconnectors  
S 41-27 36kV Outdoor switchgear.  
SWG-03-021 Primary and Secondary Substations Specification for 12kV Indoor Switchgear  
SWG-03-025 Specification for 12kV Secondary Substation Switchgear and Metering Units.  
S 37-2 415V Fuse-boards and network pillars.  
72/0750/47 Low voltage cut outs.  
SWG-03-024 Functional specification for 12kV Pole Mounted Autoreclosing Circuit Breakers.  
NG-12-034 PowerSystems Modified National Grid Transco Technical Specification 3.2.1 "Circuit Breakers". (Issue 2 - March 1999)

### **7.3 Electricity Association Technical Specifications**

ENATS 37-2 Low voltage distribution switchgear.  
ENATS 41-10 Switchgear for use on 66 and 132kV distribution system  
ENATS 41-36 Distribution switchgear for service up to 36kV(Cable and overhead conductor connected).  
ENATS 41-37 The application of fuse links to 11kV and 6.6kV / 415 V distribution networks.  
ENATS 48-2 Fault passage indicators for 6.6kV and 11kV underground and overhead distribution systems.



**7.4 British Standards**

BS88	Specification for cartridge fuses for voltages up to and including 1000 V ac and 1500 V dc.
BS1361	Cartridge fuses for AC circuits in domestic and similar premises.
BS 7654	Single phase street lighting fuses (cut-outs) for low-voltage public electricity distribution systems
BS 7656	Low-voltage pole-mounted fuses (cut outs) –315 A rating.
BS 7657	Fuses (cut-outs), ancillary terminal blocks and interconnecting units up to 100A rating, for power supplies to buildings.

**7.5 National Grid Technical Specifications**

NGTS 2.2	Switchgear for the National Grid System.
NGTS 3.2.1	Circuit Breakers
NGTS 3.2.2	Disconnectors and earthing switches
NGTS 3.2.4	Current transformers for protection and general use on the 132, 275 and 400kV systems.
NGTS 3.2.5	Voltage transformers for use on the 132, 275 and 400kV systems.
NGTS 3.2.6	Current and voltage measurement transformers for settlement metering of the 132, 66, 132, 275 and 400kV systems.

**7.6 International Electrotechnical Commission Specifications**

IEC 60044	Instrument transformers
IEC 60265	High-voltage switches.
IEC 60282	High Voltage Fuses.
IEC 60420	High-voltage alternating current switch-fuse combinations.
IEC 60694	Common specifications for high-voltage switchgear and controlgear standards
IEC 60947	Low -voltage Switchgear and controlgear.
IEC 62271-100	High-voltage alternating- current circuit breakers.
IEC 62271-102	Alternating current disconnectors and earthing switches.
IEC 62271-200	AC metal-enclosed switchgear and control gear for rated voltages above 1kV and up to and including 52kV.



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## 8 STANDARD REQUIREMENTS

It is PowerSystems policy that all New switchgear types shall not be oil insulated. Switchgear not included in this list may be purchased for extending an existing switchboard, but in all cases the Approval of the Engineering and Transmission Operations manager shall be obtained before an enquiry is issued.

## 9 EQUIPMENT APPROVAL CATEGORIES

All switchgear and associated 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.



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- (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 HV EQUIPMENT WITH VOLTAGE RATINGS 145KV TO 420KV**

**10.1 GIS**

10.1.1 420kV GIS

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
ABB Power Ltd	ELK,	63kA	P	ELK SP3 Circuit-Breaker ELK TV3 Disconnecter ELK EM3 Maintenance Earth Switch ELK AZ3 Surge Arrester ELK CB3 Current Transformer	
Areva	FB2T (T155)	63kA	R		

10.1.2 300kV GIS

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number



10.1.3 145kV GIS

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
ABB Power Ltd	ELK SW-04	40kA	A	PowerSystems Approval document SWG-06-002, Installed at Carrington 132kV substation	
Areva	F35	40kA	P		
Siemens	8DN8	31.5kA	R		
VA Tech Reyrolle	SFMT (YGS)	31.5kA	R	EA Approval - Approval Notice No 132.	



## 10.2 Open Terminal Circuit Breakers

### 10.2.1 420kV Open terminal circuit breakers

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
ABB Power Ltd	HPL 420/B2(63)	63kA	P		
Siemens	3AT2-E1	63kA	P	Installed at Auchencrosh 275kV substation	
VA Tech Reyrolle	420SPL2/1A	63kA	P	Originally approved to ESI 41-10 (50/57.5kA). Installed at Eccles 400kV substation.	



10.2.2 300kV Open terminal circuit breakers

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
ABB Power Ltd	HPL300/B1	50kA	A	Proposed for Gretna substation	
ABB Power Ltd	HPL300/B2		P	Installed at Elvanfoot 275kV substation	
Areva	FXT300-UK	40kA	A	PowerSystems Approval document SWG-06-003. Installed at Coylton 275kV substation.	
Siemens	3AQ2-EB-300	50kA	A	2 Pole version of 3AQ2-EE, Installed at Wishaw 275kV substation	
	3AQ2-EE-300	50kA	A	Installed at Kincardine 275kV substation	
VA Tech Reyrolle	300SPL2/1A special	63kA	P	420kV interrupter on a 300kV base. Proposed for Cockenzie 275kV substation.	
	300SP1A	40kA	R		



10.2.3 145kV Open terminal circuit breakers

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
ABB Power Ltd	LTB145D/B (40), BLK 222	40kA	P		
Areva	DT1	40kA	A	Dead tank design. Installed at Sankey Bridges 132kV substation.	
	GL312	40kA	R	Originally approved to ESI 41-10 (20/25kA). See EA ALS1/5 No 110.	
Mitsubishi	120-SPMT-40E (2000A)	40kA	P	Dead tank design. Installed at Braehead 132kV substation.	
Siemens	3AP1	40kA	R		
	5AP2	40kA	P	Dead tank design.	
VA Tech Reyrolle	145SPM1	25kA	P	See EA ALS1/5 No 132	
	145SPM1	31.5kA	P		

10.2.4 145kV Circuit Breakers for mechanically switched capacitors

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
ABB Power Ltd	LTB145D1/BGS (40), BLK 222	40kA	P		
Areva	S1-145F1/4031/SRSYN	40kA	P		



**10.3 Disconnectors**

10.3.1 420 kV Disconnectors

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Areva	S3CD & S3CDB (3835 mm Insulator)	63 kA	R	Motor mechanism CS630UK Drg. DIN 09326 Bus transfer contacts fitted as an option	
	S3CD & S3CDB (3350 mm Insulator)	63 kA	R	To Drawing Ref: DIN-09424 Motor mechanism CS630UK Bus transfer contacts fitted as an option	
	TPF 416 (Pantograph) With motor mechanism	63 kA	R	Excluding those with CERAM drive insulators which are category "C" - Used on SP system Bus transfer contacts fitted as an option	
Hapam	SSBIII-RB-420	63 kA	P	Horizontal Double-Break Rotation Blade with motor mechanism type EAC Bus transfer contacts fitted as an option	
	GSSB- AM420 Pantograph	63 kA	P	Bus transfer contacts fitted as an option	
Ruhrtal	ZBF 1201-4040(M)	63 kA	R	With motor mechanism MA6000	
	PRL4.4040	63kA	R	With motor mechanism MA6000	



10.3.2 300 kV Disconnectors

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Ruhrtal	DBF2-2725 (Rotating end post with motor mech)	40kA	R	Bus transfer contacts fitted as an option.	
	ZBF8-2731 (Rotating end post with motor mech)	31kA	R	Bus transfer contacts fitted as an option	
	PRL2-2731 (With motor mech type MA 600)	40kA	R	Bus transfer contacts fitted as an option	
Hapam	SSBIII-AM-300	40 kA	P	Horizontal Double-Break Fixed Blade. With motor mechanism type EAC With motor mechanism type EAF (EAC mech currently in use) Bus transfer contacts fitted as an option	



10.3.3 145 kV Disconnectors

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
Acrastyle	DB	31.5kA	P	.	
Areva	S3CD (1200 A - 2000 A)	31.5kA	P	To Drawing Ref. DIN-08515 Rev 0 # with suitably modified contact assemblies and with motor operated mechanisms	
Power Isolators	DSB – Operating mechanism type ‘PT’ (110V gear box mechanism)	31.5kA	P	<b>Note: Mechanism type PTD (plc controlled) is NOT APPROVED</b>	
Ruhrtal	ZBF 401-1420 (Hand mechanism)	31.5 kA	R	Bus transfer contacts fitted as an option	
	ZBF 402-1402 (Hand mechanism)	31.5kA	R	Bus transfer contacts fitted as an option	
	DBF 460-1425 (Hand mechanism)	40kA	P	Bus transfer contacts fitted as an option	
	DBF 230-1412 (Hand mechanism)	40kA	P	Bus transfer contacts fitted as an option	
	ZRF6- 1412 (Hand mechanism)	40kA	P	Bus transfer contacts fitted as an option	
	PRF –1420 (Hand mechanism)	31.5kA	R	Bus transfer contacts fitted as an option	
Hapam	GSSB-145	31.5kA	P	Pantograph with motor mechanism type EAC. Bus transfer contacts fitted as an option	
Areva	S3C	31.5kA 1250A	P	CMM Motor Operating mechanism CML Manual Operating mechanism (Bus transfer fitted as an option)	



**10.4 Earthing Switches**

10.4.1 420kV Earthing switches

<b>Manufacturer</b>	<b>Type</b>	<b>IEC Rating</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Areva	T with motor mechanism type CS360UK	63kA	R	Disconnecter mounted on 420kV S3CD (designated S3CDT and S3CD2T). Free standing designated D3T.	
	T with hand mechanism type	63kA	R		
Hapam	420-AM with EAC motor mechanism	63kA	P	Disconnecter mounted on all Hapam 420kV disconnectors can be fitted with ferroresonance quenching.	
	420-AM with HAC or HAD manual operated drive	63kA	P		
	ASB-420 with EAC or HAC manual operated drive	63kA	P	Free standing Can be fitted with ferroresonance quenching.	
Jacobsen	G60	63kA	R	Freestanding and disconnector mounted on all Jacobsen 420kV disconnectors. G60 ICS indicates induced current switching.	
Ruhrtal	BR.RF632-4000	63kA	R	Freestanding and disconnector mounted on all Ruhrtal 420kV disconnectors.	
	BR.RF632-4000-FR	63kA	R	Freestanding and disconnector mounted on all Ruhrtal 420kV disconnectors with ferroresonance switching ability.	



10.4.2 300kV Earthing switches

Manufacturer	Type	IEC Rating	Approval Category	Remarks	ScottishPower Part Number
Hapam	300-AM with HAC or HAD manual operated drive	31.5kA	P	Freestanding and disconnecter mounted.	
	300-AM with EAC motor mechanism	31.5kA	P	On all Hapam 300kV disconnectors with optional ferroresonance switching ability designated "FR".	
	ASB-300 with EAC motor mechanism or HAC manual operated drive	31.5kA	P	Freestanding. On all Hapam 300kV disconnectors with optional ferroresonance switching ability designated "FR".	
Ruhrtal	AERF637-2700-FR with MA-6000 power mechanism	31.5kA	R	Freestanding and disconnecter mounted on all Ruhrtal 300kV disconnectors with ferroresonance switching ability.	
	AEBF2-2700 with MA-6000 power mechanism	31.5kA	R	Freestanding and disconnecter mounted on all Ruhrtal 300kV.	
	AERF401 (H) with manual operated drive	31.5kA	R	Integrated with ZBF801 disconnecter.	



10.4.3 145kV Earthing switches

Manufacturer	Type	IEC Rating	Approval Category	Remarks	ScottishPower Part Number
Hapam	ASB145 with HAC or HAD manual operated drive	31.5kA	P	Freestanding and disconnecter mounted on all Hapam 145kV disconnectors	
Acrastyle	DEE	31.5kA	P	Installed at Sankey Bridges	
Power Isolators	AEB	31.5kA	P		
Ruhrtal	AE.BF.260 with manual operated mechanism type HG	31.5kA	P	Freestanding and disconnecter mounted on all Ruhrtal 145kV disconnectors	
	BEF2.14 with manual operated mechanism type HG	40kA	P	Freestanding and disconnecter mounted on all Ruhrtal 145kV disconnectors	
Areva	B300 (With manual and motorised operating mechanisms)	31.5kA	P	CMM Motor Operating mechanism CML Manual Operating mechanism	



**10.5 Current Transformers (Post-type open terminal)**

10.5.1 420kV Current Transformers

Manufacturer	Type	Current Rating	IEC STC Rating	Approval Category	Remarks	ScottishPower Part Number
ABB Power Ltd Telford	AOK 420	4000A	63kA	R	Drawing No 4764 075-AN	
Areva Hixon. Staffs	CTH/6	4000A	63kA	P	Drawing No 633Z1HB63386 Rev A Supersedes type FMJL 400	
	CTH 550	4000A	70kA	P	Drawing No 53516/9	
Trench AG Basal. Switzerland	IOSK 420	4000A	63kA	A	5 core design.	
	IOSK 420	4000A	63kA	A	7 core CT comprising 5 protection / measurement cores plus 2 HAM cores.	
	10SK 550	4000A	70kA	P	Drawing No 3-199653Z	



10.5.2 300kV Current Transformers

<b>Manufacturer</b>	<b>Type</b>	<b>Current Rating</b>	<b>IEC STC Rating</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
ABB Power Ltd Telford, Shropshire	AOK 300	2500A	40kA	P	Drawing No4764 075-AM	
Alstom Hixon. Staffs	CTH/4	2500A	40kA	P	Drawing No 633Z1HB63367 Supersedes type FMJL 300	
	CTH/4	3150A	40kA	P	Drawing No Z1HB63489 Rev A Oil impregnated paper insulated Suitable for installation in class IV (31 mm/kV nominal creepage) pollution sites as defined in IEC 815	
Trench AG Basel, Switzerland	IOSK 300	2500A	40kA	P	31.5mm/kV creepage. Installed on Company network.	
	IOSK 300	2500A	40kA	P	25mm creepage	
ABB Power Ltd Ludvika, Sweeden	IMB 300	2500A	40kA	A	As per SWG-06-021	



10.5.3 145kV Current Transformers

Manufacturer	Type	Current Rating	IEC STC Rating	Approval Category	Remarks	ScottishPower Part Number
ABB Power Ltd Telford. Shropshire	IMB	1250A	31.5kA	P	OIP hairpin type In accordance with drawing nos. 1HSE31322-120 (3-cores) 1HSE31323-120 (5-cores) 1HSE31324-120 (5/6-cores)	
		2000A	31.5kA	P	OIP hairpin type In accordance with drawing nos. 1HSE31322-420 (3-cores) 1HSE31323-420 (5-cores) 1HSE31324-420 (5/6-cores)	
	IMBD	1250A	31.5kA	P	OIP hairpin type	
	IMBE	2000A	31.5kA	P	OIP hairpin type	
Areva Hixon	CTH145	2000A	31.5kA	P	Drawing No 633 Z1HB63305 for stem connection (Cu primary bar) Drawing No 633 Z1HB63307 for palm connection (Al primary bar)	
	CTH/3 Mk 2	2000 A	40kA / 3 sec	P	Oil impregnated insulation Drawing No 633 Z1HB635310 Rev A (Cu primary bar) Drawing No 633 Z1HB63485 Rev A (Al primary bar) <i>Note: Total length of busbar which can be attached directly to the CT is restricted to 8 metres</i>	



<b>Manufacturer</b>	<b>Type</b>	<b>Current Rating</b>	<b>IEC STC Rating</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
ARTECHE C/o M. H. Electrical Supplies, PO Box 1 Retford, Nottinghamshire	CA-145	2000 A	31.5kA	P	OIP insulation Not for tariff metering Drawing Ref. 4210567	
Trench AG Basel, Switzerland	IOSK 170	2500A	31.5kA	P	*31.5mm/kV creepage Installed on Company network.	
	IOSK 145	2000 A	31.5kA	R		



**10.6 GIS Current Transformers**

<b>Manufacturer</b>	<b>Type</b>	<b>Current Rating</b>	<b>IEC STC Rating</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Areva Hixon	F75	2000 A		R	Metal enclosed Drawing Ref. F222235 Rev E	
Areva Montrouge France	ORBE	4000 A	63kA	R	Metal enclosed for use in GEC-A T155 GIS	
VA Tech Reyrolle	Drawing: SK1539	4000 A	57.5kA	P	For use in VA Tech Reyrolle YG2 GIS Accessed to ESI 41-10	



**10.7 Capacitor Voltage Transformers (Protection, General Instrumentation)**

10.7.1 420kV CVTs

<b>Manufacturer</b>	<b>Type</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
ABB Power Ltd Telford. Shropshire	CPA 420	P	Oil filled, 100 VA, 0.2/3P Drawing Ref. 1HSE 41300-U Installed on Company network	
Areva Hixon. Staffs	CCV420.15. 360.A1.T3	P	Oil filled. (100 VA burden). Drawing no. 633Z2HB63299 Rev C. Used on Company network	
	CCVA 1596	R	Rated secondary burden 100VA; Accuracy class 1/3P Drawing Ref. No 633Z1HB63665 Rev A	
	CCVA 420kV	P	Oil impregnated paper insulated. Accuracy 1/3P. suitable for installation in Class IV (31 mm/kV nominal creepage) pollution sites as defined in IEC 815 Drawing Ref. No Z2HB634996 Rev A	
ARTECHE C/o M. H. Electrical Supplies, P.O. Box 1 Retford, Nottinghamshire	DFK-420	R	Oil impregnated paper and polypropylene insulated. Rated secondary burden 100 or 50 VA; Accuracy class .0/3P Drawing Ref. No 4282943 Rev E	
Trench AG Basel. Switzerland	CVE 420	P	Oil filled. Tested at 100 VA rated burden. Used on SP system	



10.7.2 300kV CVTs

Manufacturer	Type	Approval Category	Remarks	ScottishPower Part Number
ABB Power Ltd Telford. Shropshire	CPA 300	A	Oil filled. 100 VA. 0.2/3P Drawing Ref. 1HSE 41300-T	
	CPH 300	P	Installed on Company network	
Areva Hixon. Staffs	CCVA 1596	R	Rated secondary burden 100VA; Accuracy class 1/3P Drawing Ref. No 633Z1HB63499 Rev A	
	CCVA 300kV	R	Oil impregnated paper insulated. Accuracy 1/3P. suitable for installation in Class IV (31 mm/kV nominal creepage) pollution sites as defined in IEC 815 Drawing Ref. No Z2HB63490 Rev D	
	CCV300.15 .240.A1.T2	P	Oil filled. 100 VA burden. Drawing 633Z2HB63298 rev C Installed on Company network	
Trench AG Basel. Switzerland	CVE 300	A	Increased creepage 31.5mm/kV Installed on Company network	3-15000366
	CVE 300	A	Oil filled. Tested at 100 VA rated burden. Installed on Company network.	



10.7.3 145kV and Lower CVTs for Grid Substations

<b>Manufacturer</b>	<b>Type</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
ABB Power Ltd Telford. Shropshire	CPA 145	P	Oil filled. 100 VA. 0.2/3P Drawing Ref. 1HSE 41300-S Installed on Company network.	
	CPA 72.5	R	Oil filled. 100 VA.0.2/3P Drawing Ref. 1HSE 41300-A	
Areva Hixon. Staffs	CCVA 1596	R	Oil filled. 100 VA 1.0/3P Drawing No 633 HB63498 Rev A	
	CCV145.15. 120.A1.T1	P	Oil filled. Tested at 100 VA rated burden. Installed on Company network.	
	WMV82-145	R	Metal enclosed, SF <sub>6</sub> filled Drawing Ref. F222202B	
ARTECHE C/o M. H. Electrical Supplies, P.O. Box 1 Retford, Nottinghamshire	DDB-145	P	OIP insulation 100 VA 1.0/3P Drawing Ref 4283936 Rev E	
Trench AG Basal. Switzerland	CVE 145	P	Oil filled. Tested at 100 VA rated burden. Installed on Company network.	



**10.8 Electromagnetic Voltage Transformers (General Instrumentation)**

10.8.1 420kV Voltage Transformers

Manufacturer	Type	Approval Category	Remarks	ScottishPower Part Number
Areva Hixon. Staffs	FVEC 420kV (cascade)	P	Oil impregnated paper insulated. Accuracy 0.2/3P (25 mm/kV nominal creepage).	
	FVEC 420kV (cascade)	P	Oil impregnated paper insulated. Accuracy 0.2/3P. suitable for installation in Class IV (31 mm/kV nominal creepage) pollution sites as defined in IEC 815. Drawing Ref. No Z12HB63497 Rev D	
Areva Liege Belgium	UDX 420	R	Metal enclosed, SF <sub>6</sub> filled for use with GEC-A T155 GIS Tested at 100 VA rated burden.	
Trench AG Basel, Switzerland	VEOS 420	R	Currently approved for HAM only. Monitoring / protection accuracy to be proven by test before cat. B.	



10.8.2 300kV Voltage Transformers

Manufacturer	Type	Approval Category	Remarks	ScottishPower Part Number
Areva Hixon. Staffs	FVEC 300kV (cascade)	P	Oil impregnated paper insulated. Accuracy 0.2/3P. (25 mm/kV nominal creepage)	
	FVEC 300kV (cascade)	P	Oil impregnated paper insulated. Accuracy 0.2/3P. suitable for installation in Class IV (31 mm/kV nominal creepage) pollution sites as defined in IEC 815 Drawing Ref. No Z12HB634988 Rev B	
Trench AG Basal. Switzerland	VEOT 300 (25 VA)	P	Oil filled, open terminal. Accuracy class 0.2. Drawing Ref No 3-139529Z Issue 01 Tested at 25 VA rated burden	
	VEOT 300 (100 VA)	P	Tested at 100 VA rated burden	



10.8.3 145kV (and below) Voltage Transformers for Grid Substations

<b>Manufacturer</b>	<b>Type</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Areva Hixon. Staffs #	FVJ (13kV)	R	13kV discharge voltage transformer. Oil impregnated paper insulation.	
	FVEC 12 (cascade)	R	Oil filled, open terminal Approved to ESI 41-10, 41-18, 50-18 and TPS 8/2 Accuracy performance to be established at IEC burdens for cat B approval.	



**10.9 Measurement Transformers For Tariff Metering**

10.9.1 420kV measurement transformers

Manufacturer	Type	CT / VT	Current Rating	IEC STC Rating	Approval Category	Remarks	ScottishPower Part Number
Areva Hixon, Staffs	FVEC (cascade)	VT	-	-	P		
Trench AG Basel, Switzerland	IOSK 420	CT	4000 A	63kA 1s	P	2 HAM cores. Tested to 0.1 and 0.2S accuracy classes. For 7 cored arrangement see TAL 3.2.4.	
	10SK 550	CT	4000 A	70kA 1s	P	Installed on Company network.	
	VEOS 420	VT			P		



10.9.2 300kV measurement transformers

<b>Manufacturer</b>	<b>Type</b>	<b>CT / VT</b>	<b>Current Rating</b>	<b>IEC STC Rating</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Areva Hixon Staffs	FVEC (cascade)	VT	-	-	P	Accuracy verification required.	
Trench AG Basal. Switzerland	IVOKT 300	CT&VT	2500 A	40kA 1s	A		
	IVOKT 300	CT&VT	2500 A	40kA 1s	A	28mm/kV creepage	3-10002256
	IOSK 300	CT	2500 A	40kA 1s	P		



10.9.3 145kV (and below) measurement transformers

<b>Manufacturer</b>	<b>Type</b>	<b>CT / VT</b>	<b>Current Rating</b>	<b>IEC STC Rating</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Areva Hixon. Staffs	FMVG36 (33kV)	CT & VT	2500 A	25kA 3s	R		
	FMVG145 (132kV)	CT & VT Standard arrangement	2000 A	31.5kA 3s	R		
	FMVG145 (132kV)	CT & VT	2000 A	31.5kA 3s	R	Comprises 200:1 single ratio CT section with a 2 turn primary	
Trench AG Bamberg. Germany	SUD145 (132kV)	VT			R	Metal enclosed SF6 filled. 3 phases in 1 tank. For use with GEC-A 145kV GIS type GMT11	
Trench AG Basal. Switzerland	IVOKT72.5 (66kV)	CT & VT	2000 A	25kA 3s	R		
	IVOKT145 (132kV)	CT & VT	2000A	31.5kA 3s	P		
	IOSK145 (132kV)	CT			P		



**11 HV EQUIPMENT WITH VOLTAGE RATINGS UP TO 145KV**

**11.1 Circuit Breakers**

11.1.1 Outdoor 36kV circuit breakers.

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Areva	OX3625-25kA	Vacuum in SF6. 1250A, 25kA design only-	P		
Hawker Siddeley Ltd.	HG 36	SF6 Rotating arc. 2000A, 25kA -	P		
FKI	Horizon	Vacuum in SF6, 1250A or 2000A; 25kA	P		

11.1.2 27.5kV Railtrack outdoor circuit breakers

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
ABB	(SF6) SFE 25.12.12		P	Suitable for mounting on pole to AC15 BRB Specification	
Areva	SMOx25 VLB		P	Suitable for mounting on pole to AC15 BRB Specification	
Hawker Siddeley	(SF6) HG 25		P	Suitable for mounting on pole to AC15 BRB Specification	



11.1.3 Indoor 36kV circuit breakers.

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
ABB Power T & D Ltd.	ZV2- 3	Vacuum in SF6. 630,1250, 2000, & 2500A ratings.	P	Active mimic diagram must be provided on front panel. Test access to be fully interlocked to EA Approval Notice 233 Revision 1. VT LV fuses to be grouped & lockable.	
Areva	WI	Vacuum in SF6. 630A, 1250A	P		
	WS	Vacuum in SF6. Up to 2000A	P	Installed at Nantwich substation	
Hawker Siddeley	HG36	SF6 Rotating Arc. Up to 2,000 A	P	Internal arc protected version only.	
Ormazabal	CML	630A switch disconnecter	P	Proposed for installation in Berwick ring	
	CMP-V	Vacuum in SF6, 630A	P	Proposed for installation in Berwick ring	
Siemens	NX plus	Vacuum in SF6, 1250 & 2000A	P	Proposed for installation in Berwick ring	
	8DA10	Vacuum in SF6 630, 1250, 2000 & 2500A	P/R*	* Ratings up to 2,000A are approval category "P". 2,500 rating is approval category "R". Additional dielectric type tests required on first production units	
ABB Power T&D Ltd	ZX 1.2	Vacuum in SF6, 1250 or 2000A	P	Feeder panels only.	



11.1.4 13kV Circuit breakers for mechanically switched capacitors connected to tertiary windings of transformers

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
ABB Power Ltd	ELFSP0-1	50kA	P	See TAL 2.18 for circuit breaker approvals associated with Relocatable Static VAr Compensator (RSVC) applications	
Areva	FX12	50kA	P	See TAL 2.18 for circuit breaker approvals associated with Relocatable Static VAr Compensator (RSVC) applications. Local control cubicle (LCC) must be produced at Stafford to NGC requirements	
Siemens	8BK40	63kA	P		



11.1.5 Indoor 12kV circuit breakers.

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Hawker Siddeley Ltd (FKI)	Hawkgas 12	Withdrawable (Vertical isolation) Ratings up to 2000A, 20kA	P	12kV, SF6 rotating arc Not internal arc proofed	
	Hawkvac 15	Withdrawable cassette up to 2000A – 25KA	P	Vacuum circuit breaker. Horizontal Isolation	
	Eclipse Feeder panel	Fixed Pattern. 630, 1250 & 2000A ratings. 21kA	A	Magnetic actuator operated vacuum circuit breaker with integral three-position disconnect/earthing switch. Air insulated busbars.	
	Eclipse Bus sections panel	Fixed Pattern. 1250 & 2000 A ratings. 21kA	A	Magnetic actuator operated vacuum circuit breaker with integral three-position disconnect/earthing switch. Air insulated busbars	
	Eclipse Busbar earthing switch	Fixed Pattern. 21kA	A	Independent manual fault making earthing switch. (For switchboards without bus section panel)	
	Eclipse Circuit connected VT	11kv/110V VT Single phase resin encapsulated	A	With integral disconnect. (Isolation via LV Fuses) Mounted in cable enclosure.	
Merlin Gerin (Schneider Electric)	Genie CB6	Fixed Pattern 630A Circuit Breaker	P	21kA rating. Withdrawable VT version only	
	Genie CB12	Fixed Pattern 1250A Circuit Breaker	P	21kA rating. Withdrawable VT version only	
	Genie SW6	Fixed Pattern 630A Switch	P	21kA. For busbar earthing	
	Genie Evo Feeder Panel	Fixed Pattern, 630 or 1250A Circuit Breaker	P	25kA Rating	
	Genie Evo Bus Section Panel	Fixed Pattern, 630 or 1250A Circuit Breaker	P	25kA Rating	



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<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Siemens	8DC11 Feeder Panel	Fixed Pattern 630 & 1250A Circuit Breaker	P	Vacuum in SF6 "sealed for life"	
	8DC11 Bus section Panel	Fixed Pattern 1000A	P	Vacuum in SF6 "sealed for life". Single Panel 1000A version only.	
	8DC11 Circuit connected VT	11kV/110V VT Resin encapsulated.	P	With integral device for breaking VT HV connection (for testing purposes). Isolation via LV Fuses.	



11.2 Ring Main Units

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
Merlin Gerin	Ringmaster RN2c-T1/16 Or RN2-T1/16	Type "A" RMU. SF6 RMU with 200A tee-off circuit breaker. <i>Free standing with rear cable box.</i>	P	RMU with VPIS & Talus EFI CTs. With TLF & 100/50/5 CTs.	C39880321
	Ringmaster RN2c- T1/16 Or RN2-T1/16	Type "B". SF6 RMU with 200A tee-off circuit breaker. <i>Free standing with rear cable box (all boxes angled).</i>	P	As Type A, but with angled cable boxes (CB and ring switches).	TBA
	Ringmaster RN2c-T1/16 Or RN2-T1/16	Type "C" RMU. SF6 RMU with 200A tee-off circuit breaker. <i>For transformer mounting.</i>	P	As Type A, but without rear cable box. Suitable for direct transformer mounting.	C3988072
	Ringmaster RN2c- T2/16 Or RN2-T2/16	Type "D" RMU. SF6 RMU with 200A tee-off circuit breaker. <i>For HV customer supplies up to 3.5MVA.</i>	P	As Type "A", but with a shunt trip coil for customer tripping. For use with direct mounted metering unit. With VIP 300 relay & 200/1 CTs	TBA
	Ringmaster RN2c-T1/16 Or RN2-T3/16	Type "C1" RMU. SF6 RMU with 200A tee-off circuit breaker. <i>For HV customer supplies up to 1.6MVA.</i>	P	As Type "A", but with a shunt trip coil for customer tripping. For use with direct mounted metering unit. .	TBA
	Ringmaster RN2c- T2/16 Or RN2-3/16 +MU2-M2/16	Type "CM1" RMU. SF6 RMU with 200A tee-off circuit breaker fitted with 200A metering unit. <i>For HV customer supplies up to 1.6MVA.</i>	P	As "Type C1" including 1.6MVA metering unit (11kV/110V VT & 100/50/5A CTs).	C39880322
Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number



Merlin Gerin	Ringmaster RN2c- T2 Or RN2-T2/16 + MU2-M3/16	Type "DM2" RMU. SF6 RMU with 200A tee-off circuit breaker-fitted with 200A metering unit. <b>For HV customer supplies up to 3.5MVA</b>	P	As "Type D", including 3.5 MVA metering unit (11kV/110V VT & 200/100/5A CTs).	C39880325
	Ringmaster RN6c	SF6 "compact" RMU with 630A tee-off circuit breaker. <b>Free standing with rear cable box and angled ring switch cable boxes.</b>	P	"Type X" RMU with 2 sets of 300/5 CTs for Solkor protection. Fully rated (16kA) circuit breaker earthing switch. Integral Circuit Breaker cable test access.	
Alstom Long & Crawford	RT Falcon	SF6 unit with 200A tee-off circuit breaker	P		TBA
Lucy	Sabre	SF6 630A circuit breaker	P	<b>Note: This RMU shall not be installed in a standard GRP enclosure</b>	
Hawker Siddeley Ltd.	Beta Mk 1	SF6 unit with 630 A circuit breaker	P	"Type X" RMU with 2 sets of 300/5 CTs for Solkor protection. Fully rated (16kA) circuit breaker earthing switch. Integral Circuit Breaker cable test access	TBA



11.3 12kV Extensible switchgear for secondary substations

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
Merlin Gerin	Ringmaster SE6-S1/21	12kV 630A SF6 switch disconnecter	P		39880323
	Ringmaster SE6-S2/21	12kV 630A SF6 switch disconnecter	P	With Actuator	39880365
	Ringmaster CE6-T4/16	12kV 630A SF6 circuit breaker	P	With VIP 300 relay	39880064
	Ringmaster CE6-T5	12kV 630A SF6 circuit breaker	P	With VIP 300 relay & metering unit	
	Ringmaster CE6-T24	12kV 630A SF6 circuit breaker	P	With VIP 300 relay & metering unit (with tertiary winding)	
	Ringmaster CE2-T1/16	12kV 200A SF6 circuit breaker	P	With TLF	39880324
	Ringmaster CE2 T2/16	12kV 200A SF6 circuit breaker	P	With VIP 300 relay	39880063



**11.4 Disconnectors & Switch disconnectors for structure or pole mounting**

11.4.1 36KV Disconnectors & Switch-disconnectors

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Merlin Gerin	PM6 Type S4	36kV Pole Mounted SF6 Switch-disconnector	P	Fault making, load breaking. Suitable for providing isolation	
Morris Line Equipment	RL	36kV Air Break Switch Disconnector	P	36kV 400A or 800A 3kA Making capacity 400A load break	
SDCEM	SB18102A	50kA 7.2 to 38kV disconnector	P	With earth switch ST90 and manual mechanism Type70	
GEVEA	GDS36	36kV rocking disconnector with silicone rubber insulators.	A	36kV; 630, 1250 or 2500A. 20 kA	
	GRS36	36kV rocking disconnector with silicone rubber insulators.	A	36kV; 630, 1250 or 2500A. 20 kA	



11.4.2 12kV Disconnectors & Switch-disconnectors

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Merlin Gerin	PM6 Type S3	11kV Pole Mounted SF6 filled Switch-disconnector	P	Fault making, load breaking. Suitable for providing isolation.	
Morris Line Equipment	RXL	12kV Air Break Switch Disconnector	P	12kV 400A 3kA Making capacity 400A load break	39900538
SDCEM	SB18102A	50kA 7.2 to 3.8kV disconnector	P	With earth switch ST90 and manual mechanism Type70	
Linegear 2000	Trisec	12kV pole mounted air break switch disconnector	A	Fault making, load breaking, fault sensing and auto sectionalising capability	
Soule	24kV/8kA	24 kV Pole Mounted SF6 Switch- disconnector with earth switch	P	Fault making, load breaking. Suitable for providing isolation	
GEVEA	GDS15	12kV air break switch disconnector, dependent manual	A	12kV, 630A 3kA making capacity.	C43811030
	GDS15	12kv air break switch disconnector, spring assisted independent manual close	A	12kV, 630A 10kA making capacity	C43811031



11.4.3 27.5kV Railtrack outdoor disconnectors

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Hawker Siddeley	RD100		P	Suitable for mounting on structures	
Morris Line equipment	RL		P	Suitable for mounting on structures	
Power Isolators	RR		P	Suitable for mounting on structures	



11.5 Pole Mounted Auto Reclosers

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
Whipp & Bourne (FKI)	GVR 38	Vacuum in SF6 Rated voltage 38kV, Rated current 630A 8kA withstand 150kV BIL	P/S*	Magnetic actuator operated. With Polar relay. Low level control box Must be fitted with surge arrestors <i>*Application limited to networks where fault level will not exceed 8kA.</i>	
Whipp & Bourne (FKI)	GVR 15	Vacuum in SF6 Rated voltage 15kV Rated current 630A 12.5kA withstand 110kV BIL	P	Magnetic actuator operated. With Polar relay. Low level control box. Must be fitted with surge arrestors.	



**11.6 Pole Mounted Auto Sectionalisers**

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Cooper (UK) Ltd	15 ASL 100 BR5-3	Auto Sectionaliser Link	P	100A 3 shot to fit GEC DJP Fusemount.	
	15 ASL 63 BR5-3	Auto Sectionaliser Link	P	63A 3 shot to fit GEC DJP Fusemount.	
	15 ASL 100 BR5-2	Auto Sectionaliser Link	P	100A 2 shot to fit GEC DJP Fusemount.	12660190
	15 ASL 63 BR5-2	Auto Sectionaliser Link	P	63A 2 shot to fit GEC DJP Fusemount.	12660188
	15 ASL 40 BR5-2	Auto Sectionaliser Link	P	40A 2 shot to fit GEC DJP Fusemount.	12660176
	15 ASL 25 BR5-2	Auto Sectionaliser Link	P	25A 2 shot to fit GEC DJP Fusemount.	12660164
	15 ASL 20 BR5-2	Auto Sectionaliser Link	P	20A 2 shot to fit GEC DJP Fusemount.	
	15 ASL 100 BR5-1	Auto Sectionaliser Link	P	100A 1 shot to fit GEC DJP Fusemount.	12660220
	15 ASL 40 BR5-1	Auto Sectionaliser Link	P	40A 1 shot to fit GEC DJP Fusemount.	12660206
	15 ASL 63 BR5-1	Auto Sectionaliser Link	P	63A 1 shot to fit GEC DJP Fusemount.	12660218
	E2906	Actuator	P	For all the above.	5320 0299



11.7 HV Fuse-links

11.7.1 Ferruled HV fuses-links for use in oil

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
Cooper Bussmann GEC B&S Fuses	O1	25A	P	120EFMA25	C1247 1240
				KEBX025A	
				120QFRN20	
Cooper Bussmann GEC B&S Fuses	O2	31.5A	P	120EFMA31.5	C1247 1252
				KEBX036A	
				120QFRN35.5	
Cooper Bussmann GEC B&S Fuses	O3	50A	P	120EFMA50	C1247 1264
				KEBX050A	
				120QFRN56	
Cooper Bussmann GEC B&S Fuses	O4	80A	P	120EFMA80	C1247 1276
				KEBX080A	
				120QFRN80	
Cooper Bussmann GEC B&S Fuses	-	125A	P	120LGMA125	C1247 1331
				KEBX125A	
				120QFRN125	
Cooper Bussmann GEC B&S Fuses	O6	125A	P	7.20HGMA125	C1247 1288
				KSMX0120	
				6.60QGRN125	



11.7.2 Tag Type HV fuses-links for use in air

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Code</b>
Cooper Bussmann	A2	31.5A	P	12BDGHC-20	C1247 1306
				K16EAX30	
Cooper Bussmann	A3	50A	P	12BDGHC-31.5	C1247 1318
				K16EAX45	
Cooper Bussmann	A4	80A	P	12BFGHD-71	C1247 1320
				K16EAX70	

11.7.3 HV expulsion fuses-links for overhead line fuse units

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Code</b>
GE Power Control	J & P	15A	P	Type FZ	C1247 7837
GE Power Control	J & P	30A	P	Type FZ	C1247 7321
GE Power Control	J & P	40A	P	Type T	C1247 5350
GE Power Control	J & P	50A	P	Type FZ	C1247 7850
GE Power Control	J & P	100A Solid Link	P	-	C3988 0102



## 12 LOW VOLTAGE EQUIPMENT

### 12.1 Distribution Fuse Boards

#### 12.1.1 Transformer mounted fuse cabinets

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
ABB Power T & D Ltd. Dundee	C6	Cabinet with six 500A outgoing ways. 1600A Busbars. ABB Part No.3220001414CF	P	Fully shielded. 92mm centres.	12110796
	C5	Cabinet with five 500A outgoing ways. 1600A Busbars. ABB Part No. 322000143F	P	Fully shielded. 92mm centre s	12110735
	C4	Cabinet with four 500A outgoing ways. 1600A Busbars. ABB Part No. 3220001412F	P	Fully shielded. 92mm centres	12110723
	C3	Cabinet with three 500A outgoing ways. 800A Busbars. ABB Part No. 3220001411F	P	Fully shielded. 92mm centres	12110838
	C2	Cabinet with two 500A outgoing ways. 800A Busbars. ABB Part No. 3220001410F	P	Fully shielded. 92mm centres	12110700



Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
ABB Power T & D Ltd. Dundee	C2 S 800 MC	Cabinet with two 500A outgoing ways. 2 ways (multi-cores) paralleled 800A Busbars ABB Part No. 3220001421F	P	For large supplies (remote) Fully shielded. 92mm centres	-
	C4 S 800 MC	Cabinet with four 500A outgoing ways. 2 ways (multi-cores) paralleled 1600A Busbars ABB Part No. 3220001340F	P	For large supplies (remote) Fully shielded. 92mm centres	12110747
	C6 S 800 MC/MC	Cabinet with six 500A outgoing ways. 2 x 2 ways (multi-cores) paralleled 1600A Busbars ABB Part No. 3220001511F	P	For large supplies (remote) Fully shielded. 92mm centres	



<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
	C2 SM 800	Cabinet with two 500A outgoing ways. 2 ways (single cores) paralleled for 4 single-cores <b>Customer metering</b> 800A Busbars ABB Part No. 3220001340F	P	For large supplies (local) Fully shielded. 92mm centres	-
	C3 SM 800	Cabinet with three 500A outgoing ways. 2 ways (single cores) paralleled for 4 single cores <b>Customer metering</b> 800A Busbars ABB Part No. 3220001423F	P	For large supplies (local) Fully shielded. 92mm centres	-
	C4 SM 800	Cabinet with four 500A outgoing ways. 2 ways (single cores) paralleled for 4 single cores <b>Customer metering</b> 1600A Busbars ABB Part No. 3220001570F	P	For large supplies (local) Fully shielded. 92mm centres	
	C4 SM 1400	Cabinet with four 500A outgoing ways. 3 ways (single cores) paralleled for 7 single cores <b>Customer metering</b> 1600A Busbars ABB Part No. 3220001570F	P	For large supplies (local) Fully shielded. 92mm centres	12110760
	C5 SM 1400	Cabinet with five 500A outgoing ways. 3 ways (single cores) paralleled for 7 single cores <b>Customer metering</b> 1600A Busbars ABB Part No. 3220001429F	P	For large supplies (local) Fully shielded. 92mm centres	12110784



12.2 LV Network Pillars

Manufacturer	Type	Descriptions	Approval Category	Remarks	ScottishPower Part Number
ABB Power T & D Ltd, Dundee.	N2	2 way network link pillar with two 500A distributor ways. To EATS 37-2 ABB Part No. 3220001227F	P	Fully shielded 92mm centres	C39887602
	N4	4 way network link pillar with four 500A distributor ways. To EATS 37-2 ABB Part No. 3220001228F	P	Fully shielded 92mm centres	C39887601



**12.3 LV Underground Link Boxes**

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
BICC	2 - Way Tailed	Factory resin filled.-185mm <sup>2</sup> 3-core	P		
		Factory resin filled- 300 mm <sup>2</sup> 3-core	P		
		Factory resin filled.- 185 mm <sup>2</sup> 4-core	P		
		Factory resin filled.- 240 mm <sup>2</sup> 4-core	P		
	4 - Way Tailed	Factory resin filled.- 185mm <sup>2</sup> 3-core	P		
		Factory resin filled.- 300 mm <sup>2</sup> 3-core	P		
		185 mm <sup>2</sup> 4-core	P		
	2 – Way Not tailed	3-core (PME)	P		
		4-core (SNE)	P		
	4 – Way Not tailed	3-core (PME)	P		
		4-core (SNE)	P		
Sicame	2 – Way Not tailed	3-core (PME)	P		
		4-core (SNE)	P		
	2 – Way Not tailed	3-core (PME)	P		
		4-core (SNE)	P		



**12.4 LV Cut-outs**

12.4.1 Heavy duty three phase cut-outs (Ratings 200A,& above - generally to EATS 37-2)

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Lucy Oxford	200A 4-pole PME	GRP insulated with 83mm fuse centres for up to 95mm <sup>2</sup> Cable.	P	Type 4MC200X3 (200A Rating) With high-density foam plate.	12422022
	315A 4-pole PME	GRP insulated with 83mm fuse centres for up to 185mm <sup>2</sup> cables.	P	Type GF185 (400A Rating) With high-density foam plate.	12421868
	500A 4-pole PME	GRP insulated with 92mm fuse centres for up to 300.mm <sup>2</sup> cables.	P	Type GF300 (630A Rating) With high-density foam plate.	12421870
WT Henley Ltd.	200A 4-pole PME	GRP insulated with 83mm fuse centres for up to 95 mm <sup>2</sup> cable.	P	Product No 54426-09 (200A Rating)	12423324
	400A 4-pole PME	GRP insulated with 83mm fuse centres for up to 185 mm <sup>2</sup> . cables.	P	Product No 54401-69 (400A Rating)	12422265
	600A 4-pole PME	GRP insulated with 92mm fuse centres for up to 300. mm <sup>2</sup> . cables.	P	Product No 54401-77 (500A Rating).	12421870



12.4.2 Domestic cut-outs (100A rating to BS 7657)

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>	
	BS 7657 Type A1 fuse-unit	Single phase cut-out with separate neutral and earth terminals & PME link	P	SNE cut-out fitted with a 100A fuse carrier.		
BICC Components WT Henley Ltd Lucy Oxford	BS 7657 Type A2 fuse-unit	Single phase cut-out with a combined neutral/earth terminal	P	PME cut-out fitted with a 100A fuse carrier.	12420906	
	BS 7557 Type B	Single phase fuse base with carrier (Used with type A unit for three phase or ganged cut-outs)	P	Single phase fuse base fitted with 100A fuse carrier	12420918	
	Cable termination cover	Termination cover for Type A1 cut-out		P	For single phase SNE cut-out	
		Termination cover for Type A2 cut-out		P	For single phase PME cut-out	12420981
		Termination Cover (Three Phase)		P	For 3 phase arrangement using one Type A2 cut-out and 2 x Type B cut-outs	12420979
	Insulated busbar	For linking incoming phase of a Type A2 cut-out with a Type B cut-out	P	For single phase ganged units for up to 130A incoming rating.	12420969	
	BS 7657 Type C1 terminal block	Neutral/earth block	P	5-way single pole insulated terminal block	12420591	



## 12.4.3 Pole mounted cut-outs (315A rating to BS 7656)

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
BICC Components WT Henley Lucy Oxford	Single Phase 315A Rating	Pole mounted cut-out to accept a BS 88 Type "J" 83mm centres fuse-link	P	All will accept cable lug with 12 mm diameter hole cable fixing	

## 12.4.4 Street lighting cut-outs (25A rating to BS 7654)

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
BICC Components Ltd.	BS 7654 Type 2	UV-SL Design No. G72516-30	P	Combined Neutral and Earth	12420013
Henley Ltd	BS 7654 Type 1	54715 - 03	P	SNE GRP cut-out	
	BS 7654 Type 2	54715 - 05	P	CNE GRP cut-out	12420013
Lucy Oxford.	BS 7654 Type 1	MCO40 SLE- 1770E	P	SNE cut-out	
	BS 7654 Type 2	MCO40SLE 1770NE	P	PME Cut-out	
	Type 1	M2SL	P	SNE cut-out Double pole fuse unit (Not BS 7654) * At request of Street Lighting Authority only.	
	ME/17710E	Weatherproof cut-out & enclosure	P	SNE cut-out	
	ME/17710NE	Weatherproof cut-out & enclosure	P	CNE cut-out	



12.4.5 Wall boxes

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
BICC Components Ltd.	Single Phase	Surface mounted box for outdoor use. Fitted with single phase cut-out	P	For high level service cable entry	12421029
	Three Phase	Surface mounted box for outdoor use. Fitted with three phase cut-out	P	For high level service cable entry	12422897

**12.5 LV Service Switch Disconnecter**

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
MEM	2 Pole (1 phase + neutral)	100A switch-disconnector	P	Double pole (phase & neutral) switch.	
	4 Pole (3 phase + neutral)	100A switch-disconnector	P	Double pole (phase & neutral) switch.	
Wylex	2 Pole (2 x 1 phase)	100A switch-disconnector	P	Phase only switched.	12321722
	3 Pole (3 x 1 phase)	100A switch-disconnector	P	Phase only switched.	12321746
	4 Pole (4x 1 phase )	100A switch-disconnector	P	Phase only switched.	12321734



**12.6 LV Fuse-links**

12.6.1 Type “J” fuse –links (to BS 88; Part 5; fig 2) for LV distribution fuse boards & heavy duty cut-outs

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Lawson Cooper Bussmann GEC	92mm (3 5/8”) fixing centres	200A	P	JSU200	C1244 6397
			P	200MJ31	
			P	JS200	
Lawson Cooper Bussmann GEC	92mm (3 5/8”) fixing centres	315A	P	JSU315	C1244 9179
			P	315MJ31	
			P	JS315	
Lawson Cooper Bussmann GEC	92mm (3 5/8”) fixing centres	400A	P	JSU400	C1244 9180
			P	400MJ31	
			P	JS400	
Lawson Cooper Bussmann GEC	92mm (3 5/8”) fixing centres	500A	P	JSU500	C1244 9192
			P	500MJ31	
			P	JS500	
Lawson Cooper Bussmann GEC	92mm (3 5/8) fixing centres	630A	P	JSU630	C1244 6117
			P	630MJ31	
			P	JS630	



<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Code</b>
Lawson Cooper Bussmann GEC	83mm (3 ¼") fixing centres	63A	P	JPU63	C1244 4832
			P	63MJ30	
			P	JP63	
Lawson Cooper Bussmann GEC	83mm (3 ¼") fixing centres	100A	P	JPU100	C1244 4856
			P	100MJ30	
			P	JP100	
Lawson Cooper Bussmann GEC	83mm (3 ¼") fixing centres	200A	P	JPU200	C1244 9143
			P	200MJ30	
			P	JP200	
Lawson Cooper Bussmann GEC	83mm (3 ¼") fixing centres	315A	P	JPU315	C1244 4900
			P	315MJ30	
			P	JP315	
Lawson Cooper Bussmann GEC	83mm (3 ¼") fixing centres	400A	P	JPU400	C1244 9167
			P	400MJ30	
			P	JP400	
Lawson Cooper Bussmann GEC	83 mm (3 ¼") fixing centres	500A	P	JPU500	C1244 4911
			P	500MJ30	
			P	JP500	
Lawson Cooper Bussmann GEC	76mm (3") fixing centres	100A	P	JHU100	C1244 4730
			P	100MJ29	
			P	JIHCS100	
Lawson Cooper Bussmann GEC	76mm (3") fixing centres	200A	P	JHU200	C1244 9120
			P	200MJ29	
			P	JOPCS200	



12.6.2 Fuse-Links for house service cut-outs (to BS 1361;)

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Lawson Cooper Bussmann GEC	BS1361 Type IIa (22.23mm end cap)	30A (for 60A fuse carrier)	P	ME30	C1244 9003
			P	30KR85	
			P	RHF30	
Lawson Cooper Bussmann GEC	BS1361 Type IIa (22.23mm end cap)	40A (for 60A fuse carrier)	P	ME40	C1244 9015
			P	40KR85	
			P	RHF40	
Lawson Cooper Bussmann GEC	BS1361 Type IIa (22.23mm end cap)	60A (for 60A fuse carrier)	P	ME60	C1244 9027
			P	60KR85	
			P	RHF60	
			P	RHF80	
Lawson Cooper Bussmann GEC	BS1361 Type IIb (30.16mm end cap)	30A (for 100A fuse carrier)	P	MF30	C1244 2124
			P	30LR85	
			P	RHLF30	
Lawson Cooper Bussmann GEC	BS1361 Type IIb (30.16mm end cap)	60A (for 100A fuse carrier)	P	MF60	C1244 2150
			P	60LR85	
			P	RHLF60	
Lawson Cooper Bussmann GEC	BS1361 Type IIb (30.16mm end cap)	80A (for 100A fuse carrier)	P	MF80	C1244 2161
			P	80LR85	
			P	RHLF80	
Lawson Cooper Bussmann GEC	BS1361 Type IIb (30.16mm end cap)	100A (for 100A fuse carrier)	P	MF100	C1244 9040
			P	100LR85	
			P	RHLF100	



12.6.3 Cylindrical non-slotted tag fuse-links for WT Henley 200A overhead line cut-outs

Manufacturer	Type	Description	Approval Category	Remarks	ScottishPower Part Number
Lawson Cooper Bussmann GEC	Barrel	63A	P	JF63	C1244 9260
			P	63MJ25	
			P	30404FHLA	
Lawson Cooper Bussmann GEC	Barrel	100	P	JF100	C1244 9271
			P	100MJ25	
			P	30406FHLA	
Lawson Cooper Bussmann GEC	Barrel	160A	P	JF160	C1244 9283
			P	160MJ25	
			P	30408FHLA	
Lawson Cooper Bussmann GEC	Barrel	200A	P	JF200	C1244 9295
			P	200MJ25	
			P	30409FHLA	



12.6.4 LV fuse-links for street lighting cut-outs

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Lawson Cooper Bussmann GEC	BS 88 - 38mm length	6A 1 axial and 1 lateral slot	P	LST6	C1244 1661
			P	6D19L	
			P	LST6	
Lawson Cooper Bussmann GEC	BS 88- 38mm length	16A 1 axial and 1 lateral slot	P	LST16	C1244 1685
			P	16D19L	
			P	LST16	



12.6.5 Industrial tag type fuse links with bolted connections (to IEC 269-2-1; fig 1)

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Lawson Cooper Bussmann GEC	B S 88 Type A2	2A Offset tag 2 hole fixing	P	GTIA2	C1244 0012
			P	A2H07	
			P	TIA2	
Lawson Cooper Bussmann GEC	B S 88 Type A2	32A Offset tag 2 hole fixing	P	GTIA32	C1244 0085
			P	32H07	
			P	TIA32	
Lawson Cooper Bussmann GEC	B S 88 Type A3	63A Offset tag 2 hole fixing	P	TIS63	C1244 0218
			P	63K07	
			P	TIS63	
Lawson Cooper Bussmann GEC	B S 88 Type A4	100A Offset tag 2 hole fixing	P	TCP100	C1244 0280
			P	100L14	
			P	TCP100	
Lawson Cooper Bussmann GEC	B S 88 Type B2	200A Central tag 2 hole fixing 111mm centres	P	TF200	C1244 0826
			P	200M09	
			P	TF200	
Lawson Cooper Bussmann GEC	B S 88 Type B3	315A Central tag 2 hole fixing 111mm centres	P	TKF315	C1244 0899
			P	315N09	
			P	TKF315	



<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Lawson Cooper Bussmann GEC	B S 88 Type C1	400A Central tag 4 hole fixing 133mm & 184mm centres 51mm barrel width	P	TM400	C1244 1065
			P	400P11	
			P	TM400	
Lawson Cooper Bussmann GEC	B S 88 Type C1	400A Central tag 4 hole fixing 165mm & 229mm centres 51mm barrel width	P	TMT400	C1244 1119
			P	400P12	
			P	TMT400	
Lawson Cooper Bussmann GEC	B S 88 Type C2	500A Central tag 4 hole fixing 133mm & 184mm centres 61mm barrel width	P	TTM500	C1244 1168
			P	500R11	
			P	TTM500	
Lawson Cooper Bussmann GEC	B S 88 Type C2	500A Central tag 4 hole fixing 165mm & 229mm centres 61mm barrel width	P	TT500	C1244 9404
			P	500R12	
			P	TT500	



**12.7 Earth Fault Indicators & Associated CTs**

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
Nortech Ltd	Electronic earth fault indicator	With core balance CT	P	For use with three phase cables.	
Bowden Brothers Ltd	Electronic earth fault indicator	With core balance CT	P	For use with three phase cables	39880369



**12.8 LV Service Distribution Boards for Multiple Occupancy Premises**

<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
BEMCO The British Electrical and Manufacturing Company Ltd.	DB 6	2-way, 3 phase & neutral distribution board	P	Rating 200A	
	DB 9	3-way, 3 phase & neutral distribution board			
	DB 12	4-way, 3 phase & neutral distribution board			
	SDB 15	5-way, 3 phase & neutral distribution board	P	Rating 315 or 500A	
	SDB 30	10-way, 3 phase & neutral distribution board			
	SDB 60	20-way, 3 phase & neutral distribution board			
MERLIN GERIN A Brand of Schneider Electric Ltd	MODE-2A2	2-way, 3 phase & neutral distribution board	P	Rating 200A	
	MODE-2A3	3-way, 3 phase & neutral distribution board			
	MODE-2A4	4-way, 3 phase & neutral distribution board			
	MODE-3B6	6-way, 3 phase & neutral distribution board	P	Rating 315A	
	MODE-3B10	10-way, 3 phase & neutral distribution board			
	MODE-3B20	20-way, 3 phase & neutral distribution board			



<b>Manufacturer</b>	<b>Type</b>	<b>Description</b>	<b>Approval Category</b>	<b>Remarks</b>	<b>ScottishPower Part Number</b>
MERLIN GERIN A Brand of Schneider Electric Ltd	MODE-5B6	6-way, 3 phase & neutral distribution board	P	Rating 500A	
	MODE-5B10	10-way, 3 phase & neutral distribution board			
	MODE-5B20	20-way, 3 phase & neutral distribution board			
	MODE-5XC6	6 + (1) -way, 3 phase & neutral distribution board	P	Rating 500A	
	MODE-5XC10	10 + (1) -way, 3 phase & neutral distribution board			
	MODE-5X4D1A	4 + (1) -way, 3 phase & neutral distribution board			
	MODE-5X4D1B	4 + (1) -way, 3 phase & neutral distribution board			