

Company Directive

ENGINEERING SPECIFICATION EE SPEC: 98/9

Relating to Approved Protection, Voltage Control and Alarm Relays and Test Access Blocks

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Implementation Date: January 2020

Approved by



Paul Jewell
DSO Development Manager

Date: 14 January 2020

Target Staff Group	Staff, contractors and Independent Connection Providers (ICPs) involved with the specification, design, installation and/or replacement of protection, alarm and voltage control schemes within Western Power Distribution's network
Impact of Change	Amber – This document changes the protection, alarm and control relays that may be used within WPD's network
Planned Assurance checks	12 months from the issue of the document the author will check CROWN records to confirm that newly installed relays comply with the relevant requirements

NOTE: The current version of this document is stored in the WPD Corporate Information Database. Any other copy in electronic or printed format may be out of date.

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IMPLEMENTATION PLAN

Introduction

This document provides a list of protection relays, alarm relays, voltage control relays and test access blocks that are approved for use within Western Power Distribution's network.

Main Changes

Full details are provided in the Document Review and Revision Table. The most significant changes are:

- Fundamentals SuperTAPP SG relays have been added
- GE Power P14DZ relay has been replaced by the P14DL relay
- GE Power P541, P542, P543, P544, P545, P546; options provided for 1300nm single mode fibre.
- Siemens 7SR11, 7SR12, 7SR15, 7SR21, 7SR23, 7SR24; model numbers and software references have been updated
- Siemens 7SR22 has been added

Impact of Changes

New relays shall comply with this document.

Target Staff Group	Staff, contractors and Independent Connection Providers (ICPs) involved with the specification, design, installation and/or replacement of protection, alarm and voltage control schemes within Western Power Distribution's network
Impact of Change	Amber – This document changes the protection, alarm and control relays that may be used within WPD's network

Implementation Actions

Managers, shall ensure that all relevant staff are briefed on and comply with the requirements of this document.

Implementation Timetable

This document shall be implemented on issue for new and substantially modified protection, alarm and voltage control specifications, designs and installations. Equipment that was ordered before the date of this document may comply with the previous version as long as the protection relays are commissioned within 12 months of the issue of this document.

REVISION HISTORY

Document Revision & Review Table		
Date	Comments	Name
January 2020	<ul style="list-style-type: none"> Fundamentals SuperTAPP SG relays have been added GE Power P14DB1 has been added GE Power P14DL has been added GE Power P14DZ has been removed GE Power P94VP model number has been corrected GE Power P541, P542, P543, P544, P545, P545; options provided for 1300nm single mode fibre. GE Power P546 software versions have been updated and options provided for 1300nm single mode fibre. Schneider P142 relay reference corrected Schneider P921 relay reference updated Siemens 7SR11, 7SR12, 7SR15, 7SR21, 7SR23, 7SR24; model numbers and software references have been updated Siemens 7SR22 has been added 	Andy Hood
September 2018	<ul style="list-style-type: none"> Schneider GCM05 relays must be installed with a MVAJ051 trip relay. It has been clarified that these MVAJ051 relays are manufactured and supplied by GE Power. 	A. Hood
August 2018	<ul style="list-style-type: none"> Siemens 7SA61 relays have been removed. 7SA522 relays may be used instead Software versions for Siemens 7SR11 and 7SR12 relays have been clarified A software version has been added to the Siemens 7SR2103-1 relay entry GE Power Agile P94VB relay software has been changed to version 54 GE Power Agile P94VP relays have been added Schneider Micom P124 has been removed Minor software releases for Schneider P120, P122, P123, P125, P127 and P142 relays have been clarified Schneider P921 relay software upgraded to version 12D 	A. Hood

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1.0 FOREWORD

This document lists protection, alarm and voltage control relays and test access blocks that are approved for use on Western Power Distribution's (WPD's) network.

Alternative equipment may be submitted to WPD's Policy Section for evaluation in accordance with POL: TP25.

2.0 APPROVED RELAY LIST

Schedule 1 lists all protection, voltage control and alarm relays and test access blocks approved by WPD.

Schedule 2 provides a key to the relay functions listed in the Approved Relay List.

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
A-Eberle	REG DP	ASC		Includes voltage transducer and ASC position transducer.
Cooper Power Systems	CL7 Firmware Version: 1.10.0	VR		For use with Cooper Power System Voltage Regulators
Fanox	SAI-C Hardware version: R2.3 Software Version: 3.08/1.03	3OC 3OCIT E EIT	Self-powered relay for use on 6.6kV and 11kV network switchgear (e.g. RMUs etc.)	ENA Notice of Conformity 201 Issue 1
Fundamentals	SuperTAPP n+ Basic	TCC		
Fundamentals	SuperTAPP n+ Advanced	TCC		
Fundamentals	RTMU	TCC Monitor		
Fundamentals	SuperTAPP SG FP1034 – AGGG000PDS-LVV-20-01 (with 4 voltage and 3 current inputs) FP1034 – AGGG00FPDS-LVV-20-01 (with 4 voltage and 10 current inputs)	TCC TCC Monitor		
GE Grid Solutions	BA300	BA		
GE Grid Solutions	DIP5000	IT S	For use with voice frequency communication circuits	ENA Notice of Conformity 152

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	MBCI with MRTP pilot supervision	PW	For use with WPD owned pilots	ENA Approval Notice 39 and 9
GE Grid Solutions	MCAA11 and MCAA21	TI		ENA Notice of Conformity 137
	MCAA11R1BU9032C (3M & 1B S/R contacts & H/R flag)	TI	For use with high burden MVAJ10x or MVAJ20x relays $I_{TEST} = 0.37A, 110Vd.c.$	Diagram 01MCAA111001 Sheet 1
	MCAA11R1BU9036C (4M S/R contacts & H/R flag)	TI	For use with high burden MVAJ10x or MVAJ20x relays $I_{TEST} = 0.37A, 110Vd.c.$	Diagram 01MCAA111001 Sheet 1
	MCAA11R1BU9037C (2M & 2B S/R contacts & H/R flag)	TI	For use with high burden MVAJ10x or MVAJ20x relays $I_{TEST} = 0.37A, 110Vd.c.$	Diagram 01MCAA111001 Sheet 1
GE Grid Solutions	MCAA12	TI		ENA Notice of Conformity 137
	MCAA12R1BU9004C (2M S/R & 1M / 1B H/R contacts & H/R flag)	TI	For use with Areva WS switchgear (Trip Coil 25VA) and Ormazabal 33kV switchgear $I_{non} = 0.15A, I_{TEST} = 0.0083A, 110Vd.c.$	Diagram 01MCAA1203 Sheet 1
	MCAA12R1BU9003C (1M/1B S/R & 1M/1B H/R contacts & H/R flag)	TI	For use with high burden MVAJ10x or MVAJ20x relays $I_{TEST} = 0.37A, 110Vd.c.$	Diagram 01MCAA1203 Sheet 1
	MCAA12R1BU9002C (1M/1B S/R & 1M/1B H/R contacts & H/R flag)	TI	For use with FKI Eclipse and Horizon switchgear. $I_{non} = 0.227A, I_{TEST} = 0.14A, 110Vd.c.$	Diagram 01MCAA1203 Sheet 1

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	MCAA12 Continued			
	MCAA12R1BU9008C (2M S/R & 1M/1B H/R contacts & H/R flag)	TI	For use with Siemens NX Plus Switchgear $I_{TEST} = 0.34A, 110Vd.c.$	
GE Grid Solutions	MCAA13	TI		ENA Notice of Conformity 137
	MCAA13R1BU9017C (2M / 2B H/R contacts & H/R flag)	TI	For use with Areva WS switchgear (Trip Coil 25VA) $I_{non} = 0.15A, I_{TEST} = 0.0083A, 110Vd.c.$	Diagram 01MCAA13001 Sheet 1
	MCAA13R1BU9047C (1M / 3B H/R contacts & H/R flag)	TI	For use with high burden MVAJ10x or MVAJ20x relays $I_{TEST} = 0.37A, 110Vd.c.$	Diagram 01MCAA13001 Sheet 1
	MCAA13R1BU9048C (2M / 2B H/R contacts & H/R flag)	TI	For use with high burden MVAJ10x or MVAJ20x relays $I_{TEST} = 0.37A, 110Vd.c.$	Diagram 01MCAA13001 Sheet 1
	MCAA13R1BU9049C (3M / 1B H/R contacts & H/R flag)	TI	For use with high burden MVAJ10x or MVAJ20x relays $I_{TEST} = 0.37A, 110Vd.c.$	Diagram 01MCAA13001 Sheet 1
	MCAA13R1BU9050C (4M H/R contacts & H/R flag)	TI	For use with high burden MVAJ10x or MVAJ20x relays $I_{TEST} = 0.37A, 110Vd.c.$	Diagram 01MCAA13001 Sheet 1
	MCAA13R1BU9017C (2M / 2B H/R contacts & H/R flag)	TI	For use with FKI Eclipse and Horizon switchgear. $I_{non} = 0.227A, I_{TEST} = 0.14A, 110Vd.c.$	Diagram 01MCAA13001 Sheet 1

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	MCAG14	BEF		Suitable panel mounted metrosil and resistor, adjustable between 0 to 2000 ohms shall be provided. ENA Notice of Completion 137
GE Grid Solutions	MCAG34	BBOC		Suitable panel mounted metrosils and resistors, adjustable between 0 to 2000 ohms (min.) shall be provided. ENA Notice of Completion 137
GE Grid Solutions	MFAC14	REF		Panel mounted metrosil and resistor adjustable between 0 and 1000 ohms (min.) shall be provided, for shunt connection. ENA Notice of Completion 137
GE Grid Solutions	MMLG02	RTB		
GE Grid Solutions	MVAA11 MVAA21	AI		All elements to have self-reset contacts and hand reset flags. ENA Notice of Conformity 137
GE Grid Solutions	MVAJ051 Cortec Ref: MVAJ051RA0201 (30Vd.c., 4 N/O & 1 N/C contact) Relay Ref: MVAJ051RA0801 (110Vd.c., 4 N/O & 1 N/C contact)	TS BBCKA		Instantaneous Self Reset Relay, Hand Reset Flag ENA Notice of Conformity 43

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	MVAJ101 Cortec Ref: MVAJ101RA0202 (30Vd.c., 8 N/O & 2 N/C contacts) MVAJ101RA0802 (110Vd.c. 8 N/O & 2 N/C contacts)	TS BBCKA		Instantaneous Self Reset Relay, Hand Reset Flag ENA Notice of Conformity 43
GE Grid Solutions	MVAJ102 Cortec Ref: MVAJ102RA0202 (30Vd.c., 8 N/O & 2 N/C contacts) Cortec Ref: MVAJ102RA0802 (110Vd.c., 8 N/O & 2 N/C contacts)	TDS		Time Delay Self Reset Relay, Hand Reset Flag ENA Notice of Conformity 43
GE Grid Solutions	MVAJ053 Cortec Ref: MVAJ053RA0201 (30Vd.c., 4 N/O & 1 N/C contact) Cortec Ref: MVAJ053RA0801 (110Vd.c., 4 N/O & 1 N/C contact)	TH		Hand Reset Relay, Hand Reset Flag ENA Notice of Conformity 43
GE Grid Solutions	MVAJ055 Cortec Ref: MVAJ055RA0201 (30Vd.c., 4 N/O & 1 N/C contact) Cortec Ref: MVAJ055RA0801 (110Vd.c., 4 N/O & 1 N/C contact)	TH TE		Hand / Electrical Reset Relay, Hand Reset Flag ENA Notice of Conformity 43

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	MVAJ105 Cortec Ref: MVAJ105RA0202 (30Vd.c., 8 N/O & 2 N/C contacts) Cortec Ref: MVAJ105RA0802 (110Vd.c., 8 N/O & 2 N/C contacts)	TH TE		Hand / Electrical Reset Relay, Hand reset Flag ENA Notice of Conformity 43
GE Grid Solutions	MVAP22	VTs		
GE Grid Solutions	MVAW02	SIR		Used with protection signalling schemes ENA Notice of Completion 137
GE Grid Solutions	MVAW11 and MVAW21	AX		ENA Notice of Completion 137
GE Grid Solutions	MVAX11	TRS		ENA Notice of Completion 137
GE Grid Solutions	MVAX12	TSS		ENA Notice of Completion 137
GE Grid Solutions	MVAX31	TCS		ENA Notice of Completion 137
GE Grid Solutions	MVTT14	TD		ENA Approval Notice 35
GE Grid Solutions	MVTP31	CTS		ENA Approval Notice 42
GE Grid Solutions	MVUA11	TD		

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	Agile P142 Cortec Ref: P142811B4M0410J (without interMicom) Cortec Ref: P14281EB4M0410J (with interMicom)	3OC 3OCIT E EIT SEF AR TCS BBCK AI (IT)	For use with 110Vd.c. auxiliary supplies.	Relay, software and logic configuration set up specifically for WPD auto-reclose application. ENA Notice of Conformity 101
GE Grid Solutions	Agile P145 Cortec Ref: P145811A4M0440J	2/3OC 2/3OCIT E EIT SEF AR TCS BBCK AI	For use with 110Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 101
GE Grid Solutions	Agile P14DB1 Cortec Ref: P14DB11C4C0500A	3OC 3DOC 3OCIT 3DOCIT EIT NVD TCS BBCK AI		ENA Notice of Conformity 186

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	Agile P14DB2 Cortec Ref: P14DB21C4C0500A	3OC 3DOC 3OCIT 3DOCIT EIT SEF NVD TCS BBCK AI		ENA Notice of Conformity 186
GE Grid Solutions	Agile P14DL1 Cortec Ref: P14DL11C4C0550A	3OC 3DOC 3OCIT 3DOCIT E EIT DEIT AR TCS BBCK AI		Relay includes load blinding and voltage controlled directional overcurrent features. ENA Notice of Conformity 186
GE Grid Solutions	Agile P14NB1 Cortec Ref: P14NB11C4C0500A	3OC 3OCIT EIT TCS BBCK AI		ENA Notice of Conformity 185

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	Agile P14NB2 Cortec Ref: P14NB21C40500A	3OC 3OCIT EIT SEF TCS BBCK AI		ENA Notice of Conformity 185
GE Grid Solutions	Agile P14NZ2 Cortec Ref: P14NZ21C4C0500A	3OC 3OCIT E EIT SEF AR TCS BBCK AI		ENA Notice of Conformity 185
GE Grid Solutions	Agile P94VB Cortec Ref: P94VB11A4B0540A	VT NVD OV UV LFDD		ENA Notice of Conformity 187
GE Grid Solutions	Agile P94VP Cortec Ref: P94VP11A4B0540A	VT OV UV LFDD SC	Relay shall not be used for NVD	ENA Notice of Conformity 187

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	Micom P443 Cortec Ref. P44381xx4x0710M	Z 3DOCIT 3OCIT EIT DEIT AR BBCK TCS VTs	Mho & quad characteristics. For use on 132kV system only.	ENA Notice of Conformity 128
GE Grid Solutions	Micom P445 Cortec Ref: P445811B4M0370J	Z 3DOCIT 3OCIT EIT DEIT AR BBCK TCS VTs	Mho Phase Characteristic and Mho/Quadrilateral E/F Characteristic. Only for use on 33kV and 66kV systems.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 142
GE Grid Solutions	Micom P541 Cortec Ref: P541814A4M0300J For use with 850nm multi-mode fibre Cortec Ref: P541814C4M0300J For use with 1300nm single-mode fibre	CD OC OCIT E EIT TCS	For use with 110Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 116

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	Micom P542 Cortec Ref: P542814A4M0300J For use with 850nm multi-mode fibre Cortec Ref: P542814C4M0300J For use with 1300nm single-mode fibre	CD OC OCIT E EIT AR TCS	For use with 110Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 116
GE Grid Solutions	Micom P543 Cortec Ref: P543814A4M0470K Cortec Ref: P543814A4M0570K For use with 850nm multi-mode fibre Cortec Ref: P543814C4M0470K Cortec Ref: P543814C4M0570K For use with 1300nm single-mode fibre	CD Z* OC OCIT E EIT DOCIT DEIT AR TCS	For use with 110Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. *Firmware version 47 does not include distance protection whereas firmware version 57 does. ENA Notice of Conformity 116
GE Grid Solutions	Micom P544 Cortec Ref: P544814A4M0470K Cortec Ref: P544814A4M0570K For use with 850nm multi-mode fibre Cortec Ref: P544814C4M0470K Cortec Ref: P544814C4M0570K For use with 1300nm single-mode fibre	CD Z* OC OCIT E EIT DOCIT DEIT AR TCS	For use with 110Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. *Firmware version 47 does not include distance protection whereas firmware version 57 does. ENA Notice of Conformity 116

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	Micom P545 Cortec Ref: P545814A4M0470K Cortec Ref: P545814A4M0570K For use with 850nm multi-mode fibre Cortec Ref: P545814C4M0470K Cortec Ref: P545814C4M0570K For use with 1300nm single-mode fibre	CD Z* OC OCIT E EIT DOCIT DEIT AR TCS	For use with 110Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. *Firmware version 47 does not include distance protection whereas firmware version 57 does. ENA Notice of Conformity 116
GE Grid Solutions	Micom P546 Cortec Ref: P546814A4M0610K Cortec Ref: P546814A4M0710K For use with 850nm multi-mode fibre Cortec Ref: P546814C4M0610K Cortec Ref: P546814C4M0710K For use with 1300nm single-mode fibre	CD Z OC OCIT E EIT DOCIT DEIT AR TCS		Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. *Firmware version 61 does not include distance protection whereas firmware version 71 does. ENA Notice of Conformity 116
GE Grid Solutions	Micom P642 Cortec Ref: P642811D4M0040J	BD REF OC OCIT E EIT VTs CTS	For use with 2 winding transformers	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 153

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
GE Grid Solutions	Micom P643 Cortec Ref: P643811A4M0040K	BD REF OC OCIT E EIT VT CTS	For use with 3 winding transformers	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 153
GE Grid Solutions	Micom P842 Cortec Ref: P842816A1M0040B	AR AR(SC) AR(DBLLC)	Mesh Corner AR only	
Hawker Siddeley Switchgear	Panacea Software Version: R305 Software Version: 8 (South West Area), 7 (South Wales Area)	3OC 3OCIT E EIT SEF AR	For use with Hawker Siddeley Switchgear GVR	
Schneider	ADVC2	3OC 3OCIT E EIT SEF AR	For use with Schneider Pole Mounted Reclosers	
Schneider	GCM05	IT	For use with WPD owned pilots	Schneider GCM05 relays are installed with GE Power MVAJ051 relays that provide indication on the front of the cubicle. ENA Approval Notice 54 and Notice of Conformity 43

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Schneider	Micom P120 Relay Ref: P120B00Z412BF1 Software Version 11F	E EIT SEF SBEF, SBEF1/2	For use with 110Vd.c. and 30Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 106 Screws shall be fitted to prevent relay withdrawal.
Schneider	Micom P122 Relay Ref: P122B00Z412CF1 Software Version 12F	3OC 3HOC 3OCIT E, EIT SBEF1/2 SEF TCS BBCK	For use with 110Vd.c. and 30Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 106 Screws shall be fitted to prevent relay withdrawal.
Schneider	Micom P123 Relay Ref: P123B00Z412CF1 Software Version 12F	3OC 3HOC 3OCIT E EIT SEF TCS	For use with 30Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 106 Screws shall be fitted to prevent relay withdrawal.

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Schneider	Micom P125 Relay Ref: P125BA0Z412FC1 Software Version 15C	E EIT DEIT NVD	For use with 110Vd.c. and 30Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 106 Screws shall be fitted to prevent relay withdrawal.
Schneider	Micom P127 Relay Ref: P127BA0Z412FC1 Software Version 15C	3DOCIT NVD DEIT SEF TCS BBCK	For use with 110Vd.c. and 30Vd.c. auxiliary supplies. Not suitable for auto-reclose	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. ENA Notice of Conformity 106 Screws shall be fitted to prevent relay withdrawal.
Schneider	Micom P142 Relay Ref: P142211B4M0460J Software Version 46V	3OC 3OCIT E EIT SEF AR TCS BBCK AI	For use with 110Vd.c. auxiliary supplies.	ENA Notice of Conformity 168
Schneider	Micom P921 Relay Ref: P9210ASZ412CD Software Version 12D	NVD	For use with 110Vd.c. and 30Vd.c. auxiliary supplies.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available ENA Notice of Conformity 129 Screws shall be fitted to prevent relay withdrawal.

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Schneider	SEPAM S40	OC OCIT E EIT SEF NVD	Only for use on Schneider Ringmaster Switchgear where SEF or NVD protection is required	
Schneider	VIP 300	OC OCIT E EIT	Only for use on Schneider Ringmaster Switchgear	
Schneider	VIP 400	OC OCIT E EIT	Only for use on Schneider Ringmaster Switchgear	
Siemens	7PG1111 (AR111) MLFB Nos: 7PG1111-1xxx0-0AC0 (30Vd.c.) 7PG1111-1xxx0-0AF0 (110Vd.c.)	AI		Instantaneous self-reset relay Hand reset flag
Siemens	7PG1112 (AR121) 7PG1112-1CC10-0AM0 (240Va.c.)	PWS	A.C. trip supply supervision used as part of the Solkor pilot supervision scheme.	Instantaneous self-reset relay Reverse operating hand reset flag
Siemens	7PG1513 (TR131) 7PG1513-1xxx0-1AF0 (110Vd.c.)	TS		Instantaneous self-reset relay, hand reset flag
Siemens	7PG1521-2 (TR212) 7PG1521-2xxx0-1xC0 (30Vd.c.) 7PG1521-2xxx0-1xF0 (110Vd.c.)	TS		Instantaneous self-reset relay, operating coil with economy cut-off, hand reset flag

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Siemens	7PG1521-4 (TR214) 7PG1521-4xxx0-1CC0 (30Vd.c.) 7PG1521-4xxx0-1CF0 (110Vd.c.)	TD		Time delay reset relay and hand reset flag
Siemens	7PG1522 (TR221) MLFB Nos : 7PG1522-1xxx0-1AC0 (30Vd.c.) 7PG1522-1xxx0-1AF0 (110Vd.c.)	TS		Instantaneous self-reset relay, hand reset flag
Siemens	7PG1741 (XR153) 7PG1741-1CC10-2AA0 (30Vd.c.) 7PG1741-1CC10-4AA0 (110Vd.c.)	TSS		Instantaneous self reset relay
Siemens	7PG2111 (Solkor R/Rf) MLFB Nos: 7PG2111-1DA30-0DB0 (1A CTs) 7PG2111-1DA30-0DD0 (5A CTs)	PW		Solkor Rf must be used with pilot supervision send units and receive units, an A.C. supervision relay and, where applicable 15kV isolation transformers.
Siemens	7PG2112 (Solkor 15kV Pilot Isolation Transformer) MLFB No: 7PG2112-0AA00-0AA0	Pilot Isolation T/F		For use with Solkor R/Rf where 15kV withstand is required.
Siemens	7PG2120 (Solkor Pilot Supervision Send Unit) MLFB Nos: 7PG2120-0AA00-1CA0 (5kV isolation) 7PG2120-0AA00-2WA0 (15kV isolation)	Pilot Supervision supply transformer / rectifier		For use with Solkor R/Rf

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Siemens	7PG2132 (B22) MLFB No: 7PG2132-1CC40-1AC0	240V A.C Supervision Relay		For use with Solkor R/Rf
Siemens	7PG2144 (B75/B74) MLFB Nos: 7PG2144-1CC40-1CE0 (110Vd.c.) 7PG2144-1CC40-1CB0 (30Vd.c.)	Pilot Supervision Receive Unit	For 5kV withstand	For use with Solkor R/Rf
Siemens	7PG2154 (B75) MLFB No: 7PG2154-1BA10-2WA0	Pilot Supervision Receive Unit	For 15kV withstand	For use with Solkor R/Rf
Siemens	7PG2164 (B74) MLFB Nos: 7PG2164-1CC40-2AE0 (110Vd.c.) 7PG2164-1CC40-2AB0 (30Vd.c.)	Pilot Supervision Interposing Relay	For 15kV withstand	For use with Solkor R/Rf and B75 unit.
Siemens	7PG2311 (5B3) MLFB No: 7PG2311-1DA30-1BA0	REF BEF		Panel mounted resistor adjustable between 0 and 1000 ohms (min.) to be provided, for shunt connection. An external metrosil is not required with this relay.
Siemens	7PG27 (DDB) MLFB No: 7PG27xx-4xAxx-0AA0	TD		Full MLFB No. depends on specific application

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Siemens	7SA522 MLFB Nos: 7SA5221-5DBxx-0xN4-LOH (24 BI, 32BO) 7SA5221-5ABxx-0xN4-LOH (8 BI, 16BO) Software Version: 4.74	Z OCIT EIT DEIT AR AR(SC) AR(DBLLC) NVD BBCK TCS	Not suitable for Peterson Coil earthed systems.	Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. ENA Notice of Conformity 58
Siemens	7SD522 MLFB No.: 7SD5221-5DBxx-xxxx-xxx Software Version: 4.73	CD Z OCIT EIT DEIT AR AR(SC) AR(DBLLC) BBCK TCS		Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. ENA Notice of Conformity 102
Siemens	7SR1101-1 (Argus C) MLFB Nos: 7SR1101-1MA12-1CA0 (30Vd.c.) 7SR1101-1NA12-1CA0 (110Vd.c.) Hardware Reference: /FF Software Version: 2436H80003 R4g-3c	E EIT SBEF SBEF1 SBEF2	Single element relay without SEF	Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. ENA Notice of Conformity 156

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Siemens	7SR1101-3 (Argus C) MLFB Nos: 7SR1101-3MA12-1CA0 (30Vd.c.) 7SR1101-3NA12-1CA0 (110Vd.c.) Hardware Reference: /FF Software Version: 2436H80003 R4g-3c	SEF	Single element SEF relay.	Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. ENA Notice of Conformity 156
Siemens	7SR1103-1 (Argus C) MLFB Nos: 7SR1103-1MA12-2CA0 (30Vd.c.) 7SR1103-1NA12-2CA0 (110Vd.c.) Hardware Reference: /FF Software Version: 2436H80003 R4g-3c	3OC 3HOC 3OCIT E EIT BBCK TCS	4 element relay without SEF, without A/R	Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. ENA Notice of Conformity 156
Siemens	7SR1103-3 (Argus C) MLFB Nos: 7SR1103-3MA12-2CA0 (30Vd.c.) 7SR1103-3NA12-2CA0 (110Vd.c.) Hardware Reference: /FF Software Version: 2436H80003 R4g-3c	3OC 3HOC 3OCIT E EIT BBCK TCS	4 element relay with SEF, without A/R	Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. ENA Notice of Conformity 156

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Siemens	7SR1204-2 (Argus C) MLFB Nos: 7SR1204-2MA12-1CA0 (30Vd.c.) 7SR1204-2NA12-1CA0 (110Vd.c.) Hardware Reference: /FF Software Version: 2436H80004 R4g-3c	DEIT NVD OV	Single element directional earth fault / NVD relay	Relay may be used in conjunction with a conventional VT or with appropriate capacitor bushings to provide NVD protection. Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. ENA Notice of Conformity 156
Siemens	7SR1206-2 (Argus C) MLFB Nos: 7SR1206-2M12-2CA0 (30Vd.c.) 7SR1206-2NA12-2CA0 (110Vd.c.) Hardware Reference: /FF Software Version: 2436H80004 R4g-3c	3DOCIT DEIT NVD OV BBCK TCS	4 element directional relay without SEF, without A/R	Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. ENA Notice of Conformity 156

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Siemens	7SR1587 MLFB No : 7SR1587-5HA12-1CA0 Hardware version: / CC Software Version: 2436H80011 R4e-2a	UV OV NVD LFDD		Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. ENA Notice of Conformity 196
Siemens	7SR2103-1 (Argus M) MLFB Nos: 7SR2103-1MA12-0DA0 (30Vd.c.) 7SR2103-1NA12-0DA0 (110Vd.c.) Hardware Reference: /CC Software Version: 2435H85008 R8e-8a	3OC 3HOC 3OCIT E EIT SBEF SEF AR BBCK TCS	4 element relay including SEF and A/R	Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. ENA Notice of Conformity 151

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Siemens	7SR2203-2 (Argus M) MLFB Nos: 7SR2203-2NA12-0DA0 (110Vd.c.) Hardware version: /DD Software Version: 2435H85008 R8e-8a	3OC 3DOC 3OCIT 3DOCIT E EIT DEIT AR TCS BBCK AI	4 element directional relay	<p>Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4.</p> <p>Relay includes load blinding and voltage controlled directional overcurrent features.</p> <p>ENA Notice of Conformity 151</p>
Siemens	7SR23 (DAD) MLFB No.: 7SR2302-1NA12-0CA0 (9BIs, 8BOs & 8LEDs) MLFB No.: 7SR2303-1NA12-0CA0 (19BIs, 16BOs & 16LEDs) Hardware version: /CC Software Version: 2435H85014 R8e-1c	BBOC	For use with 110Vd.c. auxiliary supplies.	<p>Suitable panel mounted metrosils and resistors, adjustable between 0 to 2000 ohms shall be provided.</p> <p>Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4.</p> <p>Notice of Conformity 184</p>

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
Siemens	7SR242 (Duobias) MLFB No: 7SR2423-2NA12-0BA0 Hardware version: /DD Software Version: 2662H85001 RB8b-7c	BD	For use with 2 winding transformers.	Relay may also be used for AI functions if an adequate no. of inputs and LEDs are available. Where relay inputs are used for tripping or closing functions resistors shall be provided and installed to ensure compliance with the high burden requirements defined in ENA TS 48-4. 2 Panel mounted resistors adjustable between 0 and 1000 ohms shall be provided for HV & LV REF. ENA Notice of Conformity 150
Siemens	7XG22 (RMLG02)	RTB		
Siemens	FR111T	TI		
	Order Code: VCE:EEPFR111TS521515 (4M S/R contacts, H/R flag)	TI	For use with TR2xx high burden trip relay. 0.15A, 110Vd.c.	
	Order Code: VCE:EEPFR111TS521415 (3M1B S/R contacts, H/R flag)	TI	For use with TR2xx high burden trip relay. 0.15A, 110Vd.c.	

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
	Order Code: VCE:EEPFR111TS521315 (2M2B S/R contacts, H/R flag)	TI	For use with TR2xx high burden trip relay. 0.15A, 110Vd.c.	
Siemens	FR112T	TI		
	Order Code: TBA (2M2B S/R & 1M1B H/R contacts, S/R flag)	TI	For use with TR2xx high burden trip relay. 0.15A, 110Vd.c.	
	Order Code: TBA (2M2B S/R & 1M1B H/R contacts, S/R flag)	TI	For use with 25VA trip coil 110Vd.c.	
	Order Code: TBA (2M2B S/R & 1M1B H/R contacts, S/R flag)	TI	For use with 50VA trip coil 110Vd.c.	
Siemens	FR115			
	Order Code: TBA (4M H/R contacts, H/R flag)	TI	For use with TR2xx high burden trip relay. 0.15A, 110Vd.c.	
	Order Code: TBA (3M1B H/R contacts, H/R flag)	TI	For use with TR2xx high burden trip relay. 0.15A, 110Vd.c.	
Siemens	FR115 continued			
	Order Code: TBA (2M2B H/R contacts, H/R flag)	TI	For use with TR2xx high burden trip relay. 0.15A, 110Vd.c.	

SCHEDULE 1 – APPROVED RELAY LIST

Manufacturer	Type	Functions	Restrictions	Further Comments
	Order Code: TBA (1M3B H/R contacts, H/R flag)	TI	For use with TR2xx high burden trip relay. 0.15A, 110Vd.c.	
	Order Code: TBA (2M2B H/R contacts, H/R flag)	TI	For use with 25VA trip coil 110Vd.c.	
	Order Code: TBA (2M2B H/R contacts, H/R flag)	TI	For use with 50VA trip coil 110Vd.c.	

SCHEDULE 2 – RELAY FUNCTIONS

Protection Function Reference	Description
AI	Alarm indication relay (used for buchholz alarm, winding temperature alarm, SF6 pressure low alarm etc.)
AR	Auto-reclose
AR (SC)	Auto-reclose with synchronising check
AR (DBLLC)	Auto-reclose with dead bus, live line charging
ASC	ASC control relay
AX	Auxiliary relay
AXF	Auxiliary relay with hand reset flag
BBCK	Busbar protection check relay
BBCKA	Busbar protection check auxiliary relay
3BBOC	3 element busbar overcurrent (high impedance)
BD	Biased differential
BEF	Balanced earth Fault
BA	Battery Alarm
CD	Current Differential (Feeder Unit Protection)
CTS	CT supervision
DEIT	Directional IDMT earth fault
2DOCIT	2 element directional IDMT overcurrent
3DOCIT	3 element directional IDMT overcurrent
E	Instantaneous earth fault
EIT	IDMT earth fault
3HOC	3 element high set overcurrent
IT	Intertrip send/receive system
LFDD	Low frequency demand disconnection
NVD	Neutral voltage displacement
2OC	2 element instantaneous overcurrent
3OC	3 element instantaneous overcurrent
2OCIT	2 element IDMT overcurrent
3OCIT	3 element IDMT overcurrent
3OV	3 element over voltage
PWS	Pilot wire supervision
PW	Pilot wire protection (unit protection)
RTB	Relay test block
S	Signalling relay (for distance protection schemes)
SBEF	Standby earth fault
SBEF1	Standby earth fault stage 1
SBEF2	Standby earth fault stage 2
SC	Synchronising check
SEF	Sensitive earth fault
SIR	Signalling scheme interposing relay
TCS	Trip circuit supervision

SCHEDULE 2 – RELAY FUNCTIONS

Protection Function Reference	Description
TD	Time delay relay
TI	Trip indication relay (used in series with trip coil or trip relay coil, e.g. buchholz trip, winding temperature trip etc.)
TRS	Trip relay supervision
TDS	Trip relay with 2.5s delayed reset contacts, hand reset flag
TE	Trip relay with electrically reset contacts, hand reset flag
TH	Trip relay with hand reset contacts and flag
TS	Trip relay with instantaneous self reset contacts, hand reset flag
TSS	Trip Supply Supervision
3UV	3 element under voltage
VR	Voltage regulation relay
VTs	VT supervision
Z	Distance protection

APPENDIX A

SUPERSEDED DOCUMENTATION

This document supersedes EE SPEC: 98/8 dated August 2018 which has now been withdrawn.

APPENDIX B

RECORD OF COMMENT DURING CONSULTATION

[Comments Table EE SPEC: 98/9](#)

APPENDIX C

ASSOCIATED DOCUMENTATION

POL TP25 Approval of protection, voltage control and alarm relays

APPENDIX D

KEY WORDS

Approval, Approved Relays, Relay, Alarm, Protection, Voltage Control, Test Access Block.