WESTERN POWER
DISTRIBUTION

*Serving the Midlands, South West and Wales*

# Company Directive

## ENGINEERING SPECIFICATION
## EE SPEC: 98/10

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

| | |
|---|---|
| **Author:** | **Andy Hood** |
| **Implementation Date:** | **April 2021** |
| **Approved by** | |
| | **Carl Ketley-Lowe**<br>**Engineering Policy Manager** |
| **Date:** | **8th April 2021** |

| | |
|---|---|
| **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 |

**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**

Changes have been made to the list of approved relays, a detailed list of changes is included in the revision table.

**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 responsible for the design, installation and operation of protection relays shall ensure that all relevant staff are briefed on and comply with the requirements of this document.  As the change is an update to equipment listings only, no additional briefing content has been produced. Managers shall brief out by sharing the new lists, and changes in the revision table, with their teams.

**Implementation Timetable**

This document shall be implemented on issue for new and substantially modified protection, alarm and voltage control relays. Plant and equipment ordered before this document was issued may utilise relays listed in the previous version of EE SPEC: 98 as long as this plant and equipment is put into commission within 2 years of being ordered. In all other situations, types / versions of relays that that are not listed in EE SPEC: 98/10 but were included in earlier issues of the document, may only be used for like-for-like relay replacements (i.e. to replace failed relays).

**REVISION HISTORY**

| Document Revision & Review Table | | |
|---|---|---|
| **Date** | **Comments** | **Name** |
| April 2021 | • Auto-reclose functions clarified<br>• GE P142 software version 46 is now specified<br>• Agile P14DZ2 has been reinstated for use with Schneider Genie Evo switchgear<br>• GE P14NB2 full model number has been corrected<br>• GE P543, P544, P545 software version 47 has been removed as this is no longer available<br>• GE P546 full model number has been corrected and software version 61 has been removed as this is no longer available<br>• Schneider ADVC3 has been added<br>• Schneider VIP300 has been removed<br>• Siemens FR Series relays have been removed as they are no longer available<br>• Siemens 7SR11 and 7SR12 software references have been updated. | Andy Hood |
| January 2020 | • Fundamentals SuperTAPP SG relays have been added<br>• GE Power P14DB1 has been added<br>• GE Power P14DL has been added<br>• GE Power P14DZ has been removed<br>• GE Power P94VP model number has been corrected<br>• GE Power P541, P542, P543, P544, P545, P545; options provided for 1300nm single mode fibre.<br>• GE Power P546 software versions have been updated and options provided for 1300nm single mode fibre.<br>• Schneider P142 relay reference corrected<br>• Schneider P921 relay reference updated<br>• Siemens 7SR11, 7SR12, 7SR15, 7SR21, 7SR23, 7SR24; model numbers and software references have been updated<br>• Siemens 7SR22 has been added. | Andy Hood |
| September 2018 | • 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 |
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# Contents

### 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<br>Firmware Version: 1.10.0 | VR | | For use with Cooper Power System Voltage Regulators |
| Fanox | SAI-C<br>Hardware version: R2.3<br>Software Version: 3.08/1.03 | 3OC<br>3OCIT<br>E<br>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<br><br>FP1034 – AGGG000PDS-LVV-20-01 (with 4 voltage and 3 current inputs)<br><br>FP1034 – AGGG00FPDS-LVV-20-01 (with 4 voltage and 10 current inputs) | TCC<br>TCC Monitor | | |
| GE Grid Solutions | BA300 | BA | | |
| GE Grid Solutions | DIP5000 | IT<br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>ENA Notice of Conformity 137 |
| **GE Grid Solutions** | **MVAJ051**<br><br>Cortec Ref: MVAJ051RA0201 (30Vd.c., 4 N/O & 1 N/C contact)*<br><br>Relay Ref: MVAJ051RA0801 (110Vd.c., 4 N/O & 1 N/C contact)* | **TS BBCKA** | | Instantaneous Self Reset Relay, Hand Reset Flag<br><br>* Alternative contact arrangement may be used where required<br><br>ENA Notice of Conformity 43 |

**SCHEDULE 1 – APPROVED RELAY LIST**

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

**SCHEDULE 1 – APPROVED RELAY LIST**

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| **GE Grid Solutions** | **MVAJ105**<br><br>Cortec Ref: MVAJ105RA0202 (30Vd.c., 8 N/O & 2 N/C contacts)*<br><br>Cortec Ref: MVAJ105RA0802 (110Vd.c., 8 N/O & 2 N/C contacts)* | TH<br>TE | | Hand / Electrical Reset Relay, Hand reset Flag<br><br>* Alternative contact arrangement may be used where required<br><br>ENA Notice of Conformity 43 |
| **GE Grid Solutions** | **MVAP22** | VTS | | |
| **GE Grid Solutions** | **MVAW02** | SIR | | Used with protection signalling schemes<br><br>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**<br>Cortec Ref: P142811B4M0460J (without interMicom)<br><br>Cortec Ref: P14281EB4M0460J (with interMicom) | **3OC, 3OCIT**<br>**E, EIT, SEF**<br>**AR, AR(LLC)**<br>**TCS**<br>**BBCK**<br>**AI**<br>**(IT)** | For use with 110Vd.c. auxiliary supplies. | Relay, software and logic configuration set up specifically for WPD auto-reclose application.<br><br>ENA Notice of Conformity 101 |
| **GE Grid Solutions** | **Agile P145**<br>Cortec Ref: P145811A4M0440J | **3OC, 3OCIT**<br>**3DOCIT, DEIT**<br>**E, EIT, SEF**<br>**AR, AR(SC)**<br>**AR(LLC)**<br>**AR(DBLLC)**<br>**TCS, BBCK**<br>**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.<br><br>ENA Notice of Conformity 101 |
| **GE Grid Solutions** | **Agile P14DB1**<br>Cortec Ref: P14DB11C4C0500A | **3OC, 3OCIT**<br>**3DOCIT**<br>**E, EIT, DEIT**<br>**NVD**<br>**TCS**<br>**BBCK**<br>**AI** | | ENA Notice of Conformity 186 |
| **GE Grid Solutions** | **Agile P14DB2**<br>Cortec Ref: P14DB21C4C0500A | **3OC, 3OCIT**<br>**3DOCIT**<br>**E, EIT, DEIT,**<br>**SEF**<br>**NVD**<br>**TCS**<br>**BBCK**<br>**AI** | | ENA Notice of Conformity 186 |

**SCHEDULE 1 – APPROVED RELAY LIST**

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| **GE Grid Solutions** | **Agile P14DL1**<br>Cortec Ref: P14DL11C4C0550A | **3OC, 3OCIT**<br>**3DOCIT**<br>**E, EIT, DEIT**<br>**AR, AR(SC)**<br>**AR(LLC)**<br>**AR(DBLLC)**<br>**TCS**<br>**BBCK**<br>**AI** | | Relay includes load blinding and voltage controlled directional overcurrent features.<br><br>ENA Notice of Conformity 186 |
| **GE Power** | **Agile P14DZ2**<br>Cortec Ref: P14DZ21C4C0500A | **3OC, 3OCIT**<br>**3DOCIT**<br>**E, EIT, DEIT,**<br>**SEF**<br>**AR, AR(SC)**<br>**AR(LLC)**<br>**AR(DBLLC)**<br>**TCS**<br>**BBCK**<br>**AI** | | For use with Schneider Genie Evo switchgear only.<br><br>Relay includes load blinding and voltage controlled directional overcurrent features.<br><br>ENA Notice of Conformity 186 |
| **GE Grid Solutions** | **Agile P14NB1**<br>Cortec Ref: P14NB11C4C0500A | **3OC, 3OCIT**<br>**EIT**<br>**TCS**<br>**BBCK**<br>**AI** | | ENA Notice of Conformity 185 |
| **GE Grid Solutions** | **Agile P14NB2**<br>Cortec Ref: P14NB21C4C0500A | **3OC, 3OCIT**<br>**EIT, SEF**<br>**TCS**<br>**BBCK**<br>**AI** | | ENA Notice of Conformity 185 |

## SCHEDULE 1 – APPROVED RELAY LIST

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| **GE Grid Solutions** | **Agile P14NZ2**<br>Cortec Ref: P14NZ21C4C0500A | **3OC, 3OCIT E, EIT, SEF AR TCS BBCK AI** | | ENA Notice of Conformity 185 |
| **GE Grid Solutions** | **Agile P94VB**<br>Cortec Ref: P94VB11A4B0540A | **VTS NVD OV UV LFDD** | | ENA Notice of Conformity 187 |
| **GE Grid Solutions** | **Agile P94VP**<br>Cortec Ref: P94VP11A4B0540A | **VTS OV UV LFDD SC** | Relay shall not be used for NVD | ENA Notice of Conformity 187 |
| **GE Grid Solutions** | **Micom P443**<br>Cortec Ref. P44381xx4x0710M | **Z 3DOCIT 3OCIT EIT, DEIT AR, AR(CS) AR(LLC) AR(DBLLC) BBCK TCS, VTS** | Mho & quad characteristics.<br><br>For use on 132kV system only. | ENA Notice of Conformity 128 |

## SCHEDULE 1 – APPROVED RELAY LIST

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| **GE Grid Solutions** | **Micom P445**<br>Cortec Ref: P445811B4M0370J | **Z**<br>**3DOCIT**<br>**3OCIT**<br>**EIT, DEIT**<br>**AR, AR(CS)**<br>**AR(LLC)**<br>**AR(DBLLC)**<br>**BBCK**<br>**TCS, VTS** | Mho Phase Characteristic and Mho/Quadrilateral E/F Characteristic.<br><br>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.<br><br>ENA Notice of Conformity 142 |
| **GE Grid Solutions** | **Micom P541**<br>Cortec Ref: P541814A4M0300J<br>For use with 850nm multi-mode fibre<br><br>Cortec Ref: P541814C4M0300J<br>For use with 1300nm single-mode fibre | **CD**<br>**OC**<br>**OCIT**<br>**E**<br>**EIT**<br>**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.<br><br>ENA Notice of Conformity 116 |
| **GE Grid Solutions** | **Micom P542**<br>Cortec Ref: P542814A4M0300J<br>For use with 850nm multi-mode fibre<br><br>Cortec Ref: P542814C4M0300J<br>For use with 1300nm single-mode fibre | **CD**<br>**OC**<br>**OCIT**<br>**E**<br>**EIT**<br>**AR**<br>**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.<br><br>ENA Notice of Conformity 116 |

## SCHEDULE 1 – APPROVED RELAY LIST

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| **GE Grid Solutions** | **Micom P543**<br>Cortec Ref: P543814A4M0570K<br>Cortec Ref: P543814A4M0610M*<br>For use with 850nm multi-mode fibre<br><br>Cortec Ref: P543814C4M0570K<br>Cortec Ref: P543814C4M0610M*<br>For use with 1300nm single-mode fibre | **CD, Z***<br>**OC, OCIT**<br>**DOCIT**<br>**E, EIT**<br>**DEIT**<br>**AR, AR(CS)**<br>**AR(LLC)**<br>**AR(DBLL)**<br>**TCS, VTS** | 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.<br><br>*Firmware version 61 does not include distance protection whereas firmware version 57 does.<br><br>ENA Notice of Conformity 116 |
| **GE Grid Solutions** | **Micom P544**<br>Cortec Ref: P544814A4M0570K<br>For use with 850nm multi-mode fibre<br><br>Cortec Ref: P544814C4M0570K<br>For use with 1300nm single-mode fibre | **CD, Z**<br>**OC, OCIT**<br>**DOCIT**<br>**E, EIT**<br>**DEIT**<br>**AR**<br>**TCS, VTS** | 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.<br><br>ENA Notice of Conformity 116 |
| **GE Grid Solutions** | **Micom P545**<br>Cortec Ref: P545814A4M0570K<br>For use with 850nm multi-mode fibre<br><br>Cortec Ref: P545814C4M0570K<br>For use with 1300nm single-mode fibre | **CD, Z**<br>**OC, OCIT**<br>**DOCIT**<br>**E, EIT**<br>**DEIT**<br>**AR**<br>**TCS, VTS** | 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.<br><br>ENA Notice of Conformity 116 |

## SCHEDULE 1 – APPROVED RELAY LIST

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| **GE Grid Solutions** | **Micom P546**<br>Cortec Ref: P546814A4M0710M<br>For use with 850nm multi-mode fibre<br><br>Cortec Ref: P546814C4M0710M<br>For use with 1300nm single-mode fibre | **CD, Z**<br>**OC, OCIT**<br>**DOCIT**<br>**E, EIT**<br>**DEIT**<br>**AR**<br>**TCS, VTS** | | Relay may also be used for **AI** functions if an adequate no. of inputs and LEDs are available.<br><br>ENA Notice of Conformity 116 |
| **GE Grid Solutions** | **Micom P642**<br>Cortec Ref: P642811D4M0040J | **BD**<br>**REF**<br>**OC**<br>**OCIT**<br>**E**<br>**EIT**<br>**VTS**<br>**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.<br><br>ENA Notice of Conformity 153 |
| **GE Grid Solutions** | **Micom P643**<br>Cortec Ref: P643811A4M0040K | **BD**<br>**REF**<br>**OC**<br>**OCIT**<br>**E**<br>**EIT**<br>**VTS**<br>**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.<br><br>ENA Notice of Conformity 153 |
| **GE Grid Solutions** | **Micom P842**<br>Cortec Ref: P842816A1M0040B | **AR, AR(SC)**<br>**AR(LLC)**<br>**AR(DBLLC)** | Mesh Corner AR only | |

**SCHEDULE 1 – APPROVED RELAY LIST**

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| **Hawker Siddeley Switchgear** | **Panacea**<br>Software Version: R305<br>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** | **ADVC3** | **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.<br><br>ENA Approval Notice 54 and Notice of Conformity 43 |
| **Schneider** | **Micom P120**<br>Relay Ref: P120B00Z412BF1<br>Software Version 11F | **E, EIT, SEF SBEF, BEF1/2** | 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.<br><br>ENA Notice of Conformity 106<br><br>Screws shall be fitted to prevent relay withdrawal. |

## SCHEDULE 1 – APPROVED RELAY LIST

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| **Schneider** | **Micom P122**<br>Relay Ref: P122B00Z412CF1<br>Software Version 12F | **3OC, 3HOC**<br>**3OCIT**<br>**E, EIT**<br>**SBEF1/2**<br>**SEF**<br>**TCS**<br>**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.<br><br>ENA Notice of Conformity 106<br><br>Screws shall be fitted to prevent relay withdrawal. |
| **Schneider** | **Micom P123**<br>Relay Ref: P123B00Z412CF1<br>Software Version 12F | **3OC, 3HOC**<br>**3OCIT**<br>**E, EIT, SEF**<br>**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.<br><br>ENA Notice of Conformity 106<br><br>Screws shall be fitted to prevent relay withdrawal. |
| **Schneider** | **Micom P125**<br>Relay Ref: P125BA0Z412FC1<br>Software Version 15C | **E, EIT**<br>**DEIT**<br>**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.<br><br>ENA Notice of Conformity 106<br><br>Screws shall be fitted to prevent relay withdrawal. |
| **Schneider** | **Micom P127**<br>Relay Ref: P127BA0Z412FC1<br>Software Version 15C | **3DOCIT**<br>**NVD**<br>**DEIT**<br>**SEF**<br>**TCS**<br>**BBCK** | For use with 110Vd.c. and 30Vd.c. auxiliary supplies.<br><br>**Not suitable for auto-reclose** | Relay may also be used for **AI** functions if an adequate no. of inputs and LEDs are available.<br><br>ENA Notice of Conformity 106<br><br>Screws shall be fitted to prevent relay withdrawal. |

## SCHEDULE 1 – APPROVED RELAY LIST

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| Schneider | **Micom P142**<br>Relay Ref: P142211B4M0460J<br>Software Version 46V | **3OC, 3OCIT**<br>**E, EIT, SEF**<br>**AR, AR(LLC)**<br>**TCS**<br>**BBCK**<br>**AI** | For use with 110Vd.c. auxiliary supplies. | ENA Notice of Conformity 168 |
| Schneider | **Micom P921**<br>Relay Ref: P9210ASZ412CD1<br>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<br><br>ENA Notice of Conformity 129<br><br>Screws shall be fitted to prevent relay withdrawal. |
| Schneider | **SEPAM S40** | **OC, OCIT**<br>**E, EIT**<br>**SEF**<br>**NVD** | Only for use on Schneider Ringmaster Switchgear where SEF or NVD protection is required | |
| Schneider | **VIP 400** | **OC, OCIT**<br>**E, EIT** | Only for use on Schneider Ringmaster Switchgear | |
| Siemens | **7PG1111 (AR111)**<br>MLFB Nos:<br>7PG1111-1xxx0-0AC0 (30Vd.c.)<br>7PG1111-1xxx0-0AF0 (110Vd.c.) | **AI** | | Instantaneous self-reset relay Hand reset flag |
| Siemens | **7PG1112 (AR121)**<br>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)**<br>7PG1513-1xxx0-1AF0 (110Vd.c.) | **TS** | | Instantaneous self-reset relay, hand reset flag |

## SCHEDULE 1 – APPROVED RELAY LIST

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| Siemens | **7PG1521-2 (TR212)**<br>7PG1521-2xxx0-1xC0 (30Vd.c.)<br>7PG1521-2xxx0-1xF0 (110Vd.c.) | **TS** | | Instantaneous self-reset relay, operating coil with economy cut-off, hand reset flag |
| Siemens | **7PG1521-4 (TR214)**<br>7PG1521-4xxx0-1CC0 (30Vd.c.)<br>7PG1521-4xxx0-1CF0 (110Vd.c.) | **TD** | | Time delay reset relay and hand reset flag |
| Siemens | **7PG1522 (TR221)**<br>MLFB Nos :<br>7PG1522-1xxx0-1AC0 (30Vd.c.)<br>7PG1522-1xxx0-1AF0 (110Vd.c.) | **TS** | | Instantaneous self-reset relay, hand reset flag |
| Siemens | **7PG1741 (XR153)**<br>7PG1741-1CC10-2AA0 (30Vd.c.)<br>7PG1741-1CC10-4AA0 (110Vd.c.) | **TSS** | | Instantaneous self reset relay |
| Siemens | **7PG2111 (Solkor R/Rf)**<br>MLFB Nos:<br>7PG2111-1DA30-0DB0 (1A CTs)<br>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)**<br><br>MLFB No: 7PG2112-0AA00-0AA0 | **Pilot Isolation T/F** | | For use with Solkor R/Rf where 15kV withstand is required. |

## SCHEDULE 1 – APPROVED RELAY LIST

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| **Siemens** | **7PG2120 (Solkor Pilot Supervision Send Unit**) <br> MLFB Nos: <br> 7PG2120-0AA00-1CA0 (5kV isolation) <br> 7PG2120-0AA00-2WA0 (15kV isolation) | **Pilot Supervision supply transformer / rectifier** | | For use with Solkor R/Rf |
| **Siemens** | **7PG2132 (B22)** <br> MLFB No: 7PG2132-1CC40-1AC0 | **240V A.C Supervision Relay** | | For use with Solkor R/Rf |
| **Siemens** | **7PG2144 (B75/B74)** <br> MLFB Nos: <br> 7PG2144-1CC40-1CE0 (110Vd.c.) <br> 7PG2144-1CC40-1CB0 (30Vd.c.) | **Pilot Supervision Receive Unit** | For 5kV withstand | For use with Solkor R/Rf |
| **Siemens** | **7PG2154 (B75)** <br> MLFB No: 7PG2154-1BA10-2WA0 | **Pilot Supervision Receive Unit** | For 15kV withstand | For use with Solkor R/Rf |
| **Siemens** | **7PG2164 (B74)** <br> MLFB Nos: <br> 7PG2164-1CC40-2AE0 (110Vd.c.) <br> 7PG2164-1CC40-2AB0 (30Vd.c.) | **Pilot Supervision Interposing Relay** | For 15kV withstand | For use with Solkor R/Rf and B75 unit. |
| **Siemens** | **7PG2311 (5B3)** <br> 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)** <br> 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**<br>MLFB Nos:<br>7SA5221-5DBxx-0xN4-LOH<br>(24 BI, 32BO)<br>7SA5221-5ABxx-0xN4-LOH<br>(8 BI, 16BO)<br><br>Software Version: 4.74 | **Z**<br>**OCIT**<br>**EIT, DEIT**<br>**AR, AR(SC)**<br>**AR(LLC)**<br>**AR(DBLLC)**<br>**NVD**<br>**BBCK**<br>**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.<br><br>ENA Notice of Conformity 58 |
| Siemens | **7SD522**<br>MLFB No.: 7SD5221-5DBxx-xxxx-xxx<br><br>Software Version: 4.73 | **CD, Z**<br>**OCIT**<br>**EIT, DEIT**<br>**AR, AR(SC)**<br>**AR(LLC)**<br>**AR(DBLLC)**<br>**BBCK**<br>**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.<br><br>ENA Notice of Conformity 102 |
| Siemens | **7SR1101-1 (Argus C)**<br>MLFB Nos:<br>7SR1101-1MA12-1CA0 (30Vd.c.)<br>7SR1101-1NA12-1CA0 (110Vd.c.)<br><br>Hardware Reference: /FF<br><br>Software Version:<br>2436H80003R4k-3d | **E, EIT**<br>**SBEF**<br>**SBEF1**<br>**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.<br><br>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: 2436H80003R4k-3d | **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: 2436H80003R4k-3d | **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: 2436H80003R4k-3d | **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)**<br>MLFB Nos:<br>7SR1204-2MA12-1CA0 (30Vd.c.)<br>7SR1204-2NA12-1CA0 (110Vd.c.)<br><br>Hardware Reference: /FF<br><br>Software Version:<br>2436H80004R4k-3d | **DEIT**<br>**NVD**<br>**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.<br><br>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.<br><br>ENA Notice of Conformity 156 |
| Siemens | **7SR1206-2 (Argus C)**<br>MLFB Nos:<br>7SR1206-2M12-2CA0 (30Vd.c.)<br>7SR1206-2NA12-2CA0 (110Vd.c.)<br><br>Hardware Reference: /FF<br><br>Software Version:<br>2436H80004R4k-3d | **3DOCIT**<br>**DEIT**<br>**NVD**<br>**OV**<br>**BBCK**<br>**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.<br><br>ENA Notice of Conformity 156 |

## SCHEDULE 1 – APPROVED RELAY LIST

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| Siemens | **7SR1587**<br>MLFB No :<br>7SR1587-5HA12-1CA0<br><br>Hardware version: / CC<br><br>Software Version:<br>2436H80011 R4e-2a | **UV**<br>**OV**<br>**NVD**<br>**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.<br><br>ENA Notice of Conformity 196 |
| Siemens | **7SR2103-1 (Argus M)**<br>MLFB Nos:<br>7SR2103-1MA12-0DA0 (30Vd.c.)<br>7SR2103-1NA12-0DA0 (110Vd.c.)<br><br>Hardware Reference: /DD<br><br>Software Version:<br>2435H85008 R8e-8a | **3OC, 3HOC**<br>**3OCIT**<br>**E, EIT**<br>**SBEF**<br>**SEF**<br>**AR**<br>**BBCK**<br>**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.<br><br>ENA Notice of Conformity 151 |

## SCHEDULE 1 – APPROVED RELAY LIST

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

## SCHEDULE 1 – APPROVED RELAY LIST

| Manufacturer | Type | Functions | Restrictions | Further Comments |
|---|---|---|---|---|
| Siemens | **7SR242 (Duobias)**<br>MLFB No: 7SR2423-2NA12-0BA0<br><br>Hardware version: /DD<br><br>Software Version:<br>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.<br><br>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.<br><br>2 Panel mounted resistors adjustable between 0 and 1000 ohms shall be provided for HV & LV REF.<br><br>ENA Notice of Conformity 150 |
| Siemens | **7XG22 (RMLG02)** | RTB | | |

## 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 check |
| AR (LLC) | Auto-reclose with live line check |
| 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 |

## SCHEDULE 2 – RELAY FUNCTIONS

| Protection Function Reference | Description |
|---|---|
| TCS | Trip circuit supervision |
| 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 |

**SUPERSEDED DOCUMENTATION**

This document supersedes EE SPEC: 98/9 dated January 2020 which has now been withdrawn.

**RECORD OF COMMENT DURING CONSULTATION**

Comments Table EE SPEC: 98/10

**ASSOCIATED DOCUMENTATION**

POL TP25        Approval of protection, voltage control and alarm relays

**KEY WORDS**

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