DOCUMENT CHANGE REQUEST

DCR number 748	Changes required for: General	Originator: Steve Thacker
Date: 2013/12/05	Date sent: 2012/06/21	Organisation: ESCC Executive Secretariat
Status: IMPLEMENTED		

Title:	Relays Electromagnetic Latching 50Vdc 50A 1PDT		
Number:	3602/014	Issue:	2

Other documents affected:

Page:

Total reformat/re-write of ESCC 3602/014 issue 2 as part of the ongoing conversion to the ESCC format.

The changes incorporated into 3602/014 include the following:
• editorial & technical changes that reflect the content of Generic specification No.3602 issue 3 (per DCR673).
• technical changes per approved DCRs 340, 341.
• technical changes in accordance with the still relevant content of pending DCRs 289, 348, 351, 353, 355, 357, 359, 360 (as applicable).
• additional editorial and technical changes as detailed herein.

Paragraph:

see below

Original wording:

see ESCC 3602/014 issue 2

Proposed wording:

Total reformat of this Detail Specification (from the range of various ESCC Detail Specifications, 3602/xxx, for relays under Generic Specification No. 3602) as part of the ongoing conversion of ESA/SCC legacy Detail specifications to the ESCC format, as well as amendments resulting from the changes to the Generic specification No.3602 per DCR673.
Note: The proposed technical content of ESCC3602/014 issue 3 is based on the current content of ESCC3602/014 issue 2 plus amendments discussed and agreed by ESA and CNES since 2006. Many of the amendments have already been proposed in other DCRs (those already approved: DCRs 340, 341)(those still open or intended to be withdrawn: DCRs 289, 348, 351, 353, 355, 357, 359, 360). This DCR details all changes including the applicable changes from all these other DCRs.

See below for summary of changes proposed by this DCR.

Also see the attached proposed 3602/014 Issue 3 Draft A which incorporates all amendments proposed per this DCR.

Note: known support for active procurement against this specification includes the following Manufacturer:
- REL-STPI/F (is willing to support procurement of variant 01 with the 28V coil voltage option & Variant 04 with the 48V, 28V & 12V coil voltage options)

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Summary of changes to the current format, layout and content is as follows
1) General
Rewording and restructure of various sections and paragraphs of the specification, plus other editorial changes based on the layout and editorial content of other Detail Specifications already converted to ESCC format.

2) Para 2, Reference to MIL-STD-202 is deleted (as it is not actually referenced)

3) Table 1(a),
Amend terminology used for description of Variant 04
i.e. use the following terms, for consistency/clarification purposes:
• vertical brackets instead of side flange

4) Table 1(b) Maximum Ratings.
• Overload Current Resistive for the auxiliary contacts is added (4A @ 28Vdc)
• Overload Current Resistive at 28V (300A) is deleted
• Contact Resistance is deleted (as Contact Resistance is not a rating; Contact Voltage Drop is specified in Room Temperature Electrical Measurements)
• Terminal Nut Torque ratings are added (as specified in Figure 2)
• Storage Temperature ratings are added (these standard ESCC ratings were missing).
• Note 3 on Coil voltage rise time and required applied duration is moved to be a note to Table 2 & 3 (Para 2.4.3 in 3602/014 draft 3A)

5) Figures 2(a) & 2(b),
• Dimensions ØH & ØT are specified by means of their thread designation (i.e. M3 & M4 threads)(i.e. not minimum values)
• Torque values are moved to be in the Maximum Ratings table (Para 1.5 in 3602/014 draft 3A)

6) Figure 3, Reference to Latch coil & Reset coil is deleted (as the coils are not actually distinguished)

7) Para 4.2.2: Deviation on Seal Test Fine Leak conditions is added (to Chart F2; same as existing deviation to Screening Tests & Qualification and Periodic Testing)

8) Para 4.2.3(c): Contact chatter monitoring requirement is included during Vibration Scan for clarification purposes.

9) Para 4.2.3(d) & (e) are deleted (no longer relevant to the generic spec).

10) Para 4.2.4 (a), (c), (d), (f) are deleted (no longer needed as the detail spec is now compliant with the generic spec in this regard).

11) Para 4.2.4 (e) is deleted.

12) Para 4.2.5 is deleted (no longer relevant to the generic spec).

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13) Para 4.4.1, Case description is amended (to be consistent with other ESCC relay Detail specs). 2nd sentence, Neither electro-deposited tin nor any paint shall be used, is deleted (as it is considered redundant).

14) Para 4.4.3. Nuts & washers are added to the Mounting stud requirements (same as for the main contact studs; this needs to be confirmed by the Manufacturer)

15) Para 4.5.1, Marking, item (a) & Para 4.5.2, Terminal Identification is deleted from the list of mandatory marking items (Terminal identification is actually specified by use of a colour reference bead and the terminals physical configuration, as specified in Paras 1.6.1 & 1.6.2).
Note - The Manufacture is still permitted to mark a circuit schematic on the body of the relay, if space permits, under the Marking category of ‘Manufacturer’s Own Marking’.

16) Para 4.5.4, nominal coil resistance values are deleted (as redundant information)

17) Para 4.7.1 & Table 4, Miss Test is renamed ‘Run-in’ and Table 4 is used to specify Parameter Drift Values. Miss Test Contact Resistance limit is deleted from Table 4 and replaced by Latch Voltage & Reset Voltage drift values (+/-15%)

18) Table 2 & Table 6, Voltage Proof Leakage Current test is added whenever Voltage Proof is tested (ref DCR340; note that the Voltage Proof test is retained)

19) Table 3
• For Latch Voltage the max limits only apply to the high temperature test and the min limits only apply to the low temperature test.
• For Reset Voltage the max limits only apply to the high temperature test and the min limits only apply to the low temperature test.

20) Table 3, Contact Voltage Drop test is added (to be consistent with other ESCC relay details specs).

21) Table 3 (& Table 2), Note 2 is deleted. The low temperature tests are performed at -65C (instead of -55C). Switching Time tests (tL tR tB) are performed at both high & low temperatures.

22) Figure 4, Figure 5(a), Figure 5(b) are deleted (Not applicable)

23) Table 5(a), the 3 high, low and room temperature conditions for Run-in (= “Miss Test” / Screening) are replaced by a single test temperature of 22C.

24) Table 5(b) is deleted (Generic Spec No.3602 default test conditions apply).

25) Table 6, tests that do not include electrical measurements are removed from the table (i.e. Terminal Strength). Only relevant electrical tests per the applicable test in the Generic specification are included in the Table (e.g. references to fuse continuity, visual examination are removed from the Table).

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26) Table 6, Addition of drift values (for Latch Voltage & Reset Voltage, +/-15% or +/-20%) during the following tests:
• Vibration (= Low Level Sine Vibration) (Drift is +/-15%)
• Mechanical Shock (= Low Level Mechanical Shock) (Drift is +/-15%)
• Overload (Drift is +/-15%)
• Intermediate Current (Drift is +/-15%)
• Operating Life Resistive (= Resistive Life) (Drift is +/-15%)
• Operating Life Low Level Load and Mechanical Life (= Low Level Life) (Drift is +/-15%)
• Inductive Life (Drift is +/-20%)
• Mechanical Life (Drift is +/-15%)
• High Level Sine Vibration (new test) (Drift is +/-15%)
• High Level Mechanical Shock (new test) (Drift is +/-15%)
Note 1 is added to permit an additional measurement (of drift parameters) prior to the test in question in order to facilitate the drift calculation.

27) Table 6, Salt Spray test is deleted (ref. DCR341; Note that Solderability is not added to this table)

28) Table 6, some Contact Voltage Drop limits are amended.
i.e.
• Overload: 250mV (main) & 400mV (Aux) during monitoring (was 5V & 2.8V respectively); 30mV (main) & 10mV (Aux) during final measurements (was 250mV & N/A respectively)
• Intermediate Current: 250mV (main) & 10mV (Aux) during monitoring (was 200mV & 300mV respectively); 30mV (main) & 10mV (Aux) during final measurements (was 200mV & 300mV respectively)
• Operating Life Resistive (= Resistive Life): 125mV (main) & 200mV (Aux) during monitoring (was 5V & 2.8V respectively); 30mV (main) & 10mV (Aux) during final measurements (was 250mV & 200mV respectively)
• Operating Life Low Level Load and Mechanical Life (= Low Level Life): 2.8V (Aux) during monitoring (per generic default; no change); 30mV (main) & 10mV (Aux) during final measurements (was N/A & 100mV respectively)
• Inductive Life: 50mV (main) during monitoring (was 5V); 30mV (main) & 10mV (Aux) during final measurements (was 250mV & N/A respectively)
• Mechanical Life: 30mV (main) & 10mV (Aux) during final measurements (was 250mV)

29) Table 6, Coil Life, High Level Sine Vibration & High Level Mechanical Shock electrical measurement requirements are added (to be consistent with the Generic Specification per DCR673).

Justification:

a) Part of the ongoing activity of conversion of legacy ESA/SCC specifications to the ESCC format. Amendments are made to the format and editorial content in order to be consistent with various other ESCC Detail Specifications.

b) To make the detail spec fully consistent with the requirements and content of the ESCC Generic spec 3602 issue 3 (per DCR673).

c) To incorporate specific technical changes as detailed in the relevant change item above. All changes are for the

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purposes of technical improvement and have been previously discussed with CNES/ESA.

d) Implement drift measurement limits for Latch Voltage & Reset Voltage during Screening (over Run-in) and during Qualification and Periodic Testing on specific tests (see items 17 & 26 above).
Note - This change has not yet been agreed with the ESCC Manufacturer: REL-STPI/F.

Attachments:

3602014_draft_3c_in_review.pdf, null

Modifications:

DCR contents are modified as follows in order to incorporate the latest comments consistent with other similar DCRs and agreements made by the Manufacturer (REL STPI) and CNES.

The DCR attachment is changed to be 3602/014 draft 3C which includes all the changes in the final version of this DCR.

Note: This DCR now also implements the use of alternate publishing software for this specification (was: GlobalView; is now: WORD2010).

Item 3) Table 1(a), Figure 2
Delete item and replace with the following:
The description of package & terminals for all Variants is amended as follows:
• Variant 01: Vertical 4 Stud Mount (was: Relay with 4 mounting studs)
• Variant 04: Horizontal Flange Mount (was: Relay with side flange)

Item 4) Delete the 1st bullet item from this DCR: the addition of a rating for Overload Current Resistive for auxiliary contacts.

Item 14) Para 4.4.2
Delete item and replace with the following:
In Para 4.4.2, amend Main Contacts material and finish to be type H10 (was type O) and auxiliary contacts material to be type F3 (was H3).
In Para 4.4.2, amend Main contact studs nuts and washers requirement to read:
“Main contact terminal studs shall be equipped with stainless steel nuts and silver plated beryllium copper washers.”
(Ref. DCR809)

Item 17) Para 4.7.1 & Table 4
Delete item and replace with the following:
Miss Test is renamed ‘Run-in’ and Table 4 is used to specify Parameter Drift Values.
Miss Test Contact Resistance limit is deleted from Table 4 and replaced by Latch Voltage & Reset Voltage drift values.
Drift value limits are not specified at this time. Drift values are to be recorded for information purposes only in order to

amass data so that suitable drift value limits can be specified at a later date (in a later revision).

Item 19) Delete item and replace with the following:
For Latch Voltage & Reset Voltage delete all minimum limits. Tests are performed at both high and low (-65C) temperatures.
Note 2 is deleted.
For Latch & Reset voltage, the maximum limit for UR=28V is amended to be 18V (was 19.8V).

Item 26) Table 6
Add the following note to this item and delete reference to +/-15% & +/-20%:
Note - Drift value limits are not specified in the table at this time. Drift values are to be recorded for information purposes only in order to amass data so that suitable drift value limits can be specified at a later date (in a later revision). Note 1 is added to clarify this position.

Item 28) Table 6
Delete item and replace with the following:
The following Contact Voltage Drop limits are amended or clarified:
• Overload: 5V (Main) & 1.4V (Aux) maximum during monitoring (clarification only; no actual change); 0.003 x ITEST (= 30mV Main) & 0.1 x ITEST (= 10mV Aux) (was 250mV & 300mV respectively) maximum during final measurements.

• Intermediate Current: 200mV (Main) & 300mV (Aux) maximum during monitoring (clarification only; no actual change); 0.003 x ITEST (= 30mV Main) & 0.1 x ITEST (= 10mV Aux) (was 250mV & 200mV respectively per DCR 157) maximum during final measurements.

• Operating Life Resistive (= Resistive Life): 5V (Main) & 2.8V (Aux) maximum during monitoring (clarification only; no actual change); 0.003 x ITEST (= 30mV Main) & 0.1 x ITEST (= 10mV Aux) (was 250mV & 200mV respectively) maximum during final measurements.

• Operating Life Low Level Load (= Low Level Life): 0.0025 x ITEST (= 25mV Main) & 0.1 x ITEST (= 10mV Aux) (was N/A & 100mV respectively) maximum during final measurements.

• Inductive Life: 5V (Main) maximum during monitoring (clarification only; no actual change); 0.003 x ITEST (= 30mV Main) & 0.05 x ITEST (= 5mV Aux) (was 250mV & N/A respectively) maximum during final measurements.

• Mechanical Life: 0.003 x ITEST (= 30mV Main) & 0.1 x ITEST (= 10mV Aux) (was 250 & 100mV respectively) maximum during final measurements.

New Item 30) Table 2 & Table 3
Contact Voltage Drop test current is clarified (=10A maximum (Main) & =100mA maximum (Aux) to be consistent with the generic spec). The VD max limit is specified as 0.0025 x ITEST & 0.05 x ITEST (based on 2.5mOhm (Main) & 50mOhm (Aux) values from Table 1(b) for contact resistance and the test current of 10A (Main) & 100mA (Aux) maximum).

Add New Item 31) Table 6
Amend the Voltage Proof minimum Voltage limit to be 500V (Aux contacts) or 1000V (all other points) (was up to 1250V per Table 2) for Operating Life Resistive (= Resistive Life)

Add New Item 32) Appendix A for REL STPI

Add Appendix to detail the following deviations:
• Deviations to Chart F4 High Level Sine Vibration & High Level Mechanical Shock tests which shall be not applicable for REL STPI (as requested by REL STPI due to the increased level in the Generic spec not yet having been fully assessed on non-QPL relays).

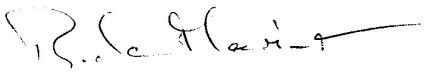
• Deviations to Chart F4: Coil Life subgroup test sequence (under Endurance Subgroup 1): Coil Life and the subsequent tests shall only be performed for Qualification. They are not required for Periodic Testing except in the case of any significant change to the design (as requested by REL STPI)

In the Justification section:

Item d) Delete item and replace with the following:
d) Implement drift measurement for Latch Voltage & Reset Voltage during Screening (over Run-in) and during Qualification and Periodic Testing on specific tests (see items 17 & 26 above). Limits have not been specified at this time due to lack of applicable performance data. Measurements will now be recorded for information purposes so that suitable drift value limits can be specified at a later date in a further revision of this specification.

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Approval signature:



Date signed:

2013-12-05