DOCUMENT CHANGE REQUEST

DCR number 708	Changes required for: General	Originator: Steve Thacker
Date: 2013/12/05	Date sent: 2012/02/10	Organisation: ESCC Executive Secretariat
Status: IMPLEMENTED		

Title:	Relays Electromagnetic Non-Latching 26.5Vdc 15A 2PDT		
Number:	3601/007	Issue:	3

Other documents affected:

Page:

Total reformat/re-write of ESCC 3601/007 issue 3 as part of the ongoing conversion to the ESCC format.

The changes incorporated into 3601/007 include the following:
• editorial & technical changes that reflect the content of Generic specification No.3601 issue 3 (per DCR672).
• technical changes per approved DCRs 254, 291, 340, 341, 369, 424, 479.
• technical changes in accordance with the still relevant content of pending DCRs 289, 346, 348, 351, 353, 355, 357, 359, 360, 479, 624 (as applicable).
• additional editorial and technical changes as detailed herein.

Paragraph:

See below

Original wording:

See 3601/007 issue 3

Proposed wording:

Total reformat of this Detail Specification (from the range of various ESCC Detail Specifications, 3601/xxx, for relays under Generic Specification No. 3601) 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.3601 per DCR672.

Note: The proposed technical content of ESCC3601/007 issue 4 is based on the current content of ESCC3601/007 issue 3 plus amendments discussed by ESA and CNES since 2006. Many of the amendments have already been proposed in other DCRs (those already approved: DCRs 254, 291, 340, 341, 369, 424, 479)(those still open or intended to be withdrawn: DCRs 289, 346, 348, 351, 353, 355, 357, 359, 360, 624). 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 3601/007 Issue 4 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 all variants and is ESCC qualified for all variants).

- STPI/F (is willing to support procurement of all variants and is ESCC qualified for all variants).
- Leach (Esterline)/F (is willing to support procurement; currently is not ESCC qualified).

Note - See item 6 below for specific action requested from these Manufacturers during the review phase of this DCR.

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) & Figure 2. Delete unsupported/obsolete Variants 01, 02, 05 (ref. DCR291)

4) Table 1(a),
Amend terminology used for description of Variants 03, 04, 06 (i.e use the term bracket instead of flange mount, for consistency purposes)
Add reference to Polarizing Pin to the description of Variant 01.

5) Table 1(b) Maximum Ratings.
6V coil voltage option is deleted (also in Para 4.5.4, Table 2 & Table 3)(ref. DCR424).
Contact Resistance is deleted (as Contact Resistance is not a rating; Contact Voltage Drop is specified in Room Temperature Electrical Measurements)
Storage Temperature ratings are added (these standard ESCC ratings were missing).

6) Figure 2(c) 2(d) 2(f),
Implement DCRs 254, 369, 479, 624 to amend dimensions C E G M P Q.

Note - DCR624 raised to amend Dimensions C E M has not yet been approved. All Manufacturers (REL-STPI/F, STPI/F, Leach (Esterline)/F) are requested to specifically review the limits applicable to Dimensions C E M for all remaining Variants 03, 04, 06 (and advise corrected values if necessary).

7) Figure 2(c), Polarizing Pin is identified in the drawing.

8) Figure 3, Circuit schematic & notes are amended to clarify terminals & connections and that the polarizing pin is connected to the case.

9) Para 4.2 & Table 6, Deviations from the generic spec are removed (no longer needed as the detail spec is now compliant with the generic spec)

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

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11) 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 (& polarizing pin for Variant 03), as specified in Paras 1.6.1 to 1.6.3).
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'.

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

13) 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 Pick-up Voltage & Drop-out Voltage drift values (+/-15%)

14) 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)

15) Table 2 & Table 3, Contact Voltage Drop test current is amended to be 15A (=Rated Resistive Load Contact Current)(was 100mA per the default condition specified in the generic spec).

16) Table 3, Pick-up Voltage & Drop-out Voltage:
• For Pick-up Voltage the max limits only apply to the high temperature test. No test is required at low temperature.
• For Drop-out Voltage the max limits only apply to the high temperature test, and the minimum limits only apply to the low temperature test.

17) Figure 4, Figure 5(a), Figure 5(b) are deleted (not applicable)

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

19) Table 5(b) is deleted (Generic Spec No.3601 default test conditions apply).

20) Table 6, tests that do not include electrical measurements are removed from the table (i.e. Terminal Strength). Only specific electrical measurement tests called up by the generic spec are included in the Table (i.e. references to contact monitoring, fuse continuity & visual examination are removed from the Table).

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

22) Table 6, some Contact Voltage Drop limits are amended.
i.e.
• Overload: 400mV during monitoring (was 2.8V)
• Intermediate Current: 10mV, 6mV, 5mV (as applicable to the Pole 2/Group 1, 2, 3 per the generic spec) during monitoring (was 30mV 18mV 6mV respectively)
• Operating Life Resistive (= Resistive Life): 150mV during monitoring (was 2.8V)

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• Inductive Life: 80mV during monitoring (was 2.8V)

23) Table 6, Random Vibration, High Level Sine Vibration & High Level Mechanical Shock electrical measurement requirements are added (to be consistent with the Generic Specification per DCR672)

24) Table 6, Addition of drift values (for Pick-up Voltage & Drop-out Voltage, +/-15%) during the following tests:
• Vibration (= Low Level Sine Vibration)
• Mechanical Shock (= Low Level Mechanical Shock)
• Overload
• Intermediate Current
• Operating Life Resistive (= Resistive Life)
• Inductive Life
• Mechanical Life
• Random Vibration (new test)
• High Level Sine Vibration (new test)
• High Level Mechanical Shock (new test)

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.

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 3601 issue 3 (per DCR672).

c) To incorporate specific technical changes as detailed in the relevant change item above. All changes are for the purposes of technical improvement and have been previously discussed with CNES/ESA.

d) Implement drift measurement limits for Pick-up Voltage & Drop-out Voltage during Screening (over Run-in) and during Qualification and Periodic Testing on specific tests (see items 13 & 24 above).
Note - This change item has not yet been agreed with the 3 supporting Manufacturers: REL-STPI/F, STPI/F, Leach (Esterline)/F.

Attachments:

3601007_draft_4a_in_review_per_dcr.pdf, null

Modifications:

DCR contents are modified as follows in order to incorporate the latest comments and agreements made by the Manufacturers (LEACH, REL STPI) and CNES.

The DCR attachment is changed to be 3601/007 draft 4E 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).

Amend note on Manufacturer support to read as follows:
Note: known support for active procurement against this specification includes the following Manufacturers:
- REL-STPI/F (is willing to support procurement of variants 03 04 06 and is ESCC qualified for variants 03 04 06).
- STPI/F (is willing to support procurement of all variants and is ESCC qualified for all variants).
- Leach International Europe/F (is willing to support procurement of all variants and is ESCC qualified for variants 03 04 06).

Item 3) Table 1(a), Figure 2
Variant 05 is reinstated (in spite of DCR291; at the specific request of Leach/F who states that such a design is procured by their customers for space applications, and therefore dispute the case put in DCR291 that such a design is a bad solution for mounting)

Item 4) Table 1(a), Figure 2
Delete item and replace with the following:
The description of package & terminals for all Variants is amended as follows (to be consistent with MIL terminology):
• “Horizontal Flange Mount” changed to “Raised Vertical Flange Mount”
• “Vertical Flange Mount” changed to “Horizontal Flange Mount”
• “Plug-in Terminals” changed to “Solder Pin Terminals”
• “Solderable Hook-end Terminals” changed to “Solder Hook Terminals”
• Polarizing pin is added to the description for Variants 03 & 05

Item 6) Figure 2(c) 2(d) 2(e) 2(f)
Delete item and replace with the following:
Dimensions as follows are amended (as requested by Leach) (see attachment for details)(see also DCRs 254, 369, 479, 624; however this DCR takes precedence):
Variant 03: A B1 C D D1 E F G H M P Q
Variant 04: A C D E F G H M P Q
Variant 05: A B1 C D D1 E F G H M P Q
Variant 06: A C D E F G H M P Q

Dimension B1 plus the gasket are deleted for figure 2c, 2e
Dia.G clarified to be the inner diameter for figures 2d, 2f
Polarizing pin is identified in the figures 2c, 2e

Item 7) Figure 2(c), 2(e)
Add Variant 05 (fig 2(e)) to this item.

Item 13) 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 Pick-up Voltage & Drop-out 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 15) Table 2 & Table 3
Delete item and replace with the following:
Contact Voltage Drop test current is specified (= 100mA minimum to 15A maximum to be consistent with the generic spec). The VD max limit is specified as 0.01 x ITEST (based on 10mOhm value from Table 1(b) for contact resistance and the test current of 100mA to 15A)(as requested by Leach).

Item 16) Deleted from this DCR

Item 22) Table 6
Delete item and replace with the following:
The following Contact Voltage Drop limits are amended or clarified:
• Overload: 2.8V maximum during monitoring (clarification only; no actual change); 0.015 x ITEST (= 225mV) maximum during final measurements (clarification only; no actual change).

• Intermediate Current: 175mV, 30mV, 18mV, 6mV (as applicable to the 4 Poles per the generic spec) during monitoring (clarification only; no actual change); 0.015 x ITEST (= 225mV)(was 175mV) maximum during final measurements.

• Operating Life Resistive (= Resistive Life): 2.8V maximum during monitoring (clarification only; no actual change); 0.015 x ITEST (= 225mV) maximum during final measurements (clarification only; no actual change).

• Inductive Life: 2.8V maximum during monitoring (clarification only; no actual change); 0.015 x ITEST (= 225mV) maximum during final measurements (clarification only; no actual change).

• Mechanical Life: 0.015 x ITEST (= 225mV)(was 175mV) maximum during final measurements.

Item 23) Table 6
Delete the new test “Random Vibration” (as it does not apply to relays >= 5A)

Item 24) Table 6
Add the following note to this item and delete reference to +/-15%:
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.
Delete the new test “Random Vibration” (as it does not apply to relays >= 5A)

Add New Item 25) Table 3
For Pick-up voltage, the maximum limit for UR=12V is amended to be 9.9V (was 8.5V respectively) (as requested by Leach)

Add New Item 26) Table 6
Amend the Voltage Proof minimum Voltage limit to be 1000V (was 1250V per Table 2) for the following tests: Overload,

Intermediate Current, Operating Life Resistive (= Resistive Life) & Inductive Life.

Add New Item 27) Appendix A for Leach International Europe
Add Appendix to detail the following deviations:
• Deviation to Materials & Finishes – Terminals: To specify a different terminal material for Leach relays: Iron-Cobolt (was type H); plus to allow a modification to finish type 3 such that: tin-lead plating shall have a composition of 85 to 95% tin (remainder lead) (was 30 to 70% tin (remainder lead)) (as requested by Leach).

• Deviations to Chart F4 High Level Sine Vibration & High Level Mechanical Shock tests which shall be not applicable for Leach (as requested by Leach due to the increased level in the Generic spec not yet having been fully assessed).

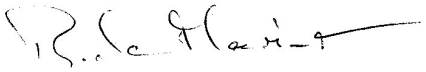
• Deviations to Chart F4: Coil Life subgroup test sequence (under Endurance Subgroup 1): Coil Life and the subsequent tests shall only be performed for Qualification. They are not required for Periodic Testing except in the case of any significant change to the design (as confirmed by Leach)

Add New Item 28) Appendix B for REL STPI
Add Appendix to detail the following deviations:
• 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 Pick-up Voltage & Drop-out Voltage during Screening (over Run-in) and during Qualification and Periodic Testing on specific tests (see items 13 & 24 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.

Approval signature:



Date signed:

2013-12-05