Title: **Herschel EQM SVM Simulator Integration**

CI-No: 152000

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|---|---|---|
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| Issue | Date | Sheet | Description of Change | Release |
|---|---|---|---|---|
| 1 | 20.05.05 | all | Initial issue | |

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# 1 Introduction

## 1.1 Scope

This Procedure describes all activities for instrument Warm Units (WU's) integration to the EQM SVM simulator.

The document is built up as a step by step procedure and starts with the mechanical integration of warm units (WU's) to the SVM simulator side panels and will be completed with instruments SVM power and bus cabling integration and verification.

For autonomous activity blocks (e. g. SIH integration, functional testing of WU's) separate specific procedures are available and this present procedure shall have the character of a leading procedure.

# 2 Documents

## 2.1 Applicable Documents (AD)

Applicable documents (AD) are defined as being documents which are needed to complete the work, they are considered as being integral part of this document, as far as specifically called-up.

The following documents in their latest issue are applicable to the specification :

| AD # | Document Title | Document Identifier |
|---|---|---|
| AD 01 | SVM simulator drawing set | 2547-152-000-500-01-0A |
| AD 02 | HIFI warm unit handling procedure | SRON-U/WIH/PR/2004-001 |
| AD 03 | PACS warm units handling procedure | PACS-ME-HP-001 |
| AD 04 | SPIRE warm units handling procedure | SPIRE-RAL-PRC-002181 |
| AD 05 | HIFI stand alone test procedure | SRON-U/HIFI/PR/2004-007 |
| AD 06 | PACS stand alone test procedures | PACS-ME-TP-0016 |
| AD 07 | SPIRE stand alone test procedure | SPIRE-RAL-PRC-002422 |
| AD 08 | HIFI WU electrical integration Procedure with IDAS | HP-2-ASED-TP-0058 |
| AD 09 | PACS WU electrical integration Procedure with IDAS | HP-2-ASED-TP-0055 |
| AD 10 | SPIRE WU electrical integration Procedure with IDAS | HP-2-ASED-TP-0057 |
| AD 11 | HIFI 1 | HP-NXH-DW-1024 |
| AD 12 | HIFI 2 | HP-NXH-DW-1023 |
| AD 13 | PACS | HP-NXH-DW-1021 |
| AD 14 | SPIRE | HP-NXH-DW-1022 |
| AD 15 | | H-P-2-ASPI-SP-0902 |

## 2.2 Reference Documents

| | | |
|---|---|---|
| RD 01 | PA Plan | HP-2-ASED-PL-0007 |
| RD 02 | General Design and Interface Requirements (GDIR) | H-P-1-ASPI-SP-0027 |
| RD 03 | Reinigungsvorschrift für Komponenten im Projekt Herschel | HP-2-ASED-PR-0008 |
| RD 04 | Herschel PLM/EQM General AIT Procedure | HP-ASED-PR-0012 |
| RD 05 | EQM AIT Plan | HP-ASED-PL-0022 |
| RD 06 | List of Acronyms | HP-2-ASPI-LI-0077 |

# 3 Configuration

## 3.1 Initial EQM SVM-simulator/H/W configuration

- SVM simulator mounted and placed in clean room class 100 000
- All vertical side panels and horizontal closure panels drilled according warm units -and harness support brackets I/F hole pattern

## 3.2 Environmental Requirements

All activities according this procedure have to be performed in a **clean room class 100 000** Federal standard 209 E

Temperature: 22 °C ± 3 °C

Relative Humidity: 40% to 60%

### 3.3 Herschel SVM Simulator Axis orientation

For all axis definitions according this procedure the Herschel coordinate System is applicable.

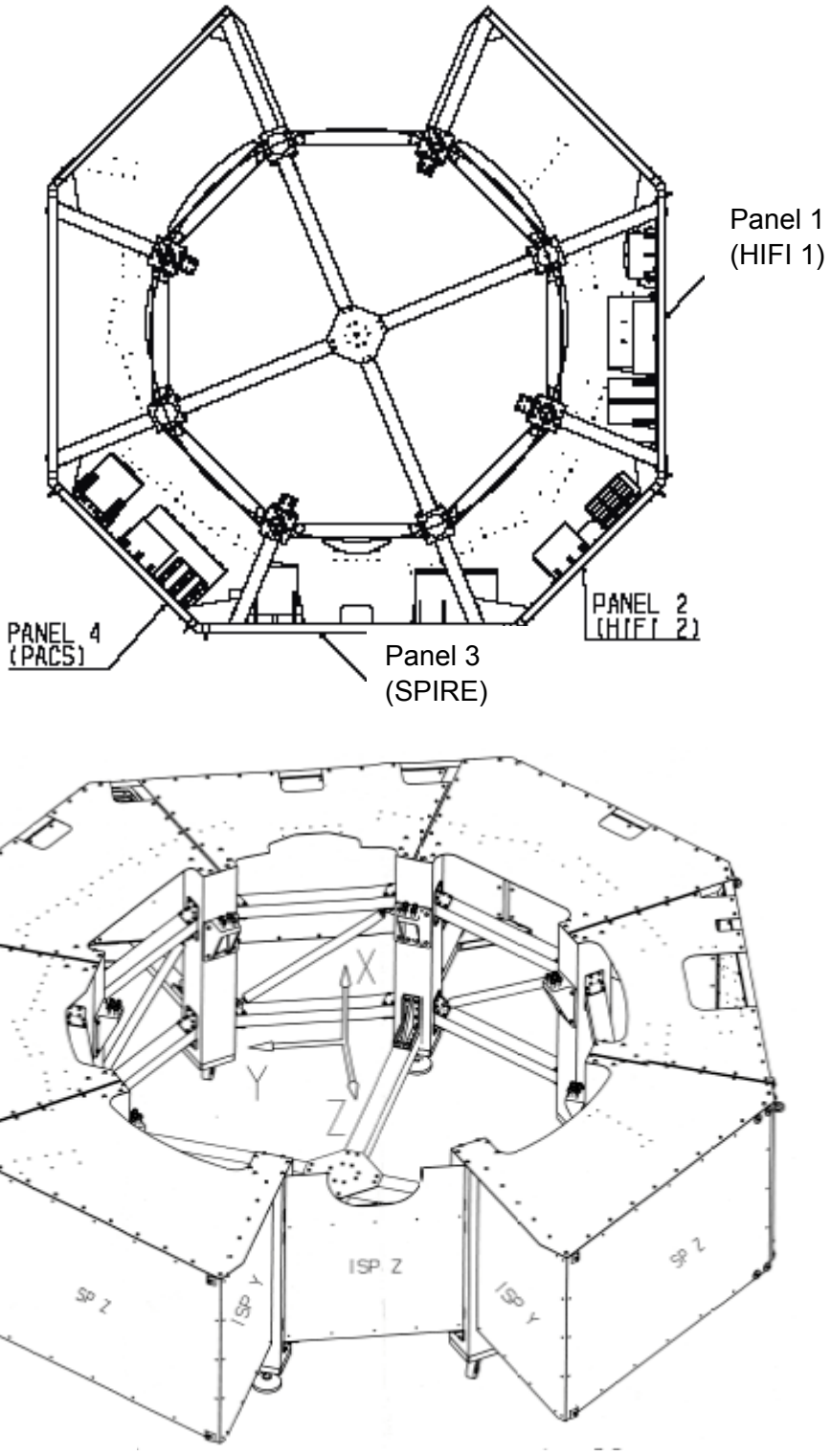


Fig.: 1 SVM Simulator Coordinates system, vertical axis equal X-axis

# 4 Requirements

## 4.1 General Instructions for SVM Simulator Integration

### 4.1.1 Safety Requirements, Precautions

No special hazards are expected. Respect of the standard technical rules for mechanical and electrical integration and test activities are sufficient. ESD safety precautions to be respected if requested.

### 4.1.2 QA Requirements

Quality Assurance shall monitor all operations (handling, transportation, dismantling and installation) as necessary to assure compliance with this procedure and the applicable requirements of the PA-Plan AD 01.
In the course of this procedure QA shall pay a particular attention to

- the application of adequate protections to critical surfaces
- the records in the log-sheet
- the recording of the serial number of the test equipment used
- to ensure that the test equipment used is within actual calibration cycle

QA has to make sure that NCR's are raised when applicable and treated by NRB procedure as defined in the PA-Plan AD 01.

After the conclusion that a activity is successfully completed this activity has to be signed by the responsible AIT- and QA engineer in the step by step procedure. Also relevant log sheets have to be filled out and signed

### 4.1.3 Prerequisites

At least the following tasks have to be successfully completed before start with PLM SVM Simulator Integration:

- Formal release to start activities given by QA available
- This procedure released and accepted

All parts and tools required available and operational

### 4.1.4 ESD Constraints

In order to prevent ESD sensitive H/W from any possible damages by accidental electrostatic discharges an ESD protected area must be defined and setup during ESD sensitive activities:

- Floor and test bench of the ESD protected area has to be covered with anti-static mats
- During all handling activities (as transport, mounting, mating/de-mating of connectors, measurements with individual measurement devices, etc.) the operator has to work on anti static mats with correct clothing and personal grounding-straps
- Adequate ESD clothing is required:
  - Anti static coat
  - Anti static gloves
  - Anti static boots
- Transportation of ESD sensitive H/W will be made only in ESD protective bag or box

## 4.2 Personnel

Personnel necessary to complete activities according this present procedure

| Title | Function | Name |
|---|---|---|
| Test conductor | Overall responsible | *) |
| Mechanical Operator | Mechanical operations | *) |
| Electrical operator | Competent for routing/fixation of harness, verification of harness function | *) |
| QA Representative | To ensure QA requirements | *) |

*) Names to be registered prior to start of test activities

# 5 Ground Support Equipment GSE

GSE necessary for this procedure

## 5.1 Facility Equipment/Instrumentation (clean room cl. 100 000)

| Equipment | Reference |
|---|---|
| Facility crane and standard hoisting accessories | - |
| Set of standard integration tooling | - |
| Standard cleaning equipment (such as IPA, lintfree rags, ultrasonic bath, UV lamp, halogen lamp, vacuum cleaner...) | - |

## 5.2 Special Equipment

| Equipment | Reference |
|---|---|
| GOSSEN METRAWATT bonding measurement device | Metra Hit 271 |
| HIFI provided EGSE and test equipment | tbd |
| PACS provided EGSE and test equipment | tbd |
| SPIRE provided EGSE and test equipment | tbd |

# 6 Documentation Requirements

## 6.1 Changes of Procedure during integration

Any activity deviating from the approved procedure requires the agreement of Project, AIV, QA responsible (Alcatel and ESA), and shall be documented via procedure variation sheet and listed in the table below:

| | | | Signature | | | | |
|---|---|---|---|---|---|---|---|
| **No.** | **Para.** | **Variation Description** | **TC** | **PA** | **ASPI** | **ESA** | **Action req.** |
| | | | | | | | |

## 6.2 Non-Conformance Reports

Any failure or anomaly be found during work according this procedure a Non-conformance report shall be written. For major NCR's test shall be continued only upon written or verbal authorisation of Customer (Alcatel and ESA).
All Non - Conformances generated during this test shall be recorded in the table below:

| NCR - No. | NCR - Title | Date | Status |
|---|---|---|---|
| | | | |

## 6.3 Test Report

The test report shall cover the following contents:

- Summary (specimen, procedure)
- Activity sequences (dates of actual sequence)
- Appendix A: filled out test procedure
- Appendix B: list of NCR's/NRB's

# 7 Activity Flow

| | |
|---|---|
| 7.1 | Mechanical Integration of HIFI WU's |
| 7.2 | Grounding of HIFI WU's |
| 7.3 | Installation of HIFI WU's interconnecting harness |
| 7.4 | HIFI WU's bench test (stand alone test)<br>(not part of this procedure) |
| 7.5 | Mechanical Integration of PACS warm units |
| 7.6 | Grounding of PACS WU's |
| 7.7 | Installation of PACS WU's interconnecting harness |
| 7.8 | PACS WU's bench test (stand alone test)<br>(not part of this procedure) |
| 7.9 | Mechanical Integration of SPIRE WU's |
| 7.10 | Grounding of SPIRE WU's |
| 7.11 | Installation of SPIRE WU's interconnecting harness |
| 7.12 | SPIRE WU's bench test (stand alone test)<br>(not part of this procedure) |
| 7.13 | Integration of SIH support brackets to SVM closure panels |

# 7 Activity flow (cont'd)

| | |
|---|---|
| **7.14** | **Installation of SVM HIFI SIH from SVM harness brackets to HIFI warm units I/F's (not part of this procedure)** |
| **7.15** | **Installation of SVM PACS SIH from SVM harness brackets to PACS warm units I/F's (not part of this procedure)** |
| **7.16** | **Installation of SVM SPIRE SIH from SVM harness brackets to SPIRE warm units I/F's (not part of this procedure)** |
| **7.17** | **SVM EGSE cable I/F bracket and EGSE cabling integration on lower panels for HIFI, PACS and SPIRE** |
| **7.18** | **Instrument WU's electrical integration Procedure with IDAS (not part of this procedure)** |

Fig.: 2 principal SVM simulator integration flow

(Sequence of tasks can vary, parallel activities accepted if feasible)

# 8 Step-by-Step Procedure

## 8.1 Mechanical Integration of HIFI Warm Units (WU's)

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.1.1.1 | Perform incoming inspection of HIFI WU's incl. HIFI WU's interconnecting harness:<br>• cleaning and cleanliness inspection of ext. surfaces<br>• visual inspection<br>• completeness of documentation (ADP) | | | |
| 8.1.1.2 | Remove side panel 1 (-Y axis) and side panel 2 (-Y, -Z) from SVM simulator structure and place panels on adequate support to allow comfortable access for WU's integration. (Lower panels remains installed) | | | |
| 8.1.1.3 | Ensure acceptable grounding of side panels before WU's integration | | | |
| 8.1.1.4 | Preinstall the following HIFI WU's on side panel 1:<br>• LCU<br>• LSU Simulator<br>• HRH<br>• WOH<br>• WEH<br>• IFH (Connector bracket)<br>and on side panel 2:<br>• FCU<br>• ICU<br>All screws hand tight | | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | Completed at: | Test Conductor:<br><br>AIT QA: |

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.1.1.5 | Adapt grounding straps from each HIFI WU to side panel and copy grounding strap I/F hole on side panels | | | **ESD precautions to be respected** |
| 8.1.1.6 | Perform drilling of marked grounding strap I/F holes in side panel 1 and side panel 2. For drilling remove HIFI WU's from side panels. Use vacuum cleaner. | | | **ESD precautions to be respected** |
| 8.1.1.7 | Perform cleaning of side panel1 and side panel 2 with IPA and lint free rags | | | |
| 8.1.1.8 | Final mech. installation of HIFI WU's and equipment on side panel 1:<br>• IFH (Connector bracket)<br>• LCU<br>• LSU Simulator<br>• HRH<br>• WOH<br>• WEH<br>and on side panel 2:<br>• FCU<br>• ICU<br>Screw down of HIFI WU's fixation screws with defined torque<br>Torque to be applied<br>Marking of fixation screws after application of defined torque | M5 - 3.8 Nm ± 0.3 Nm<br>M6 - 5.0 Nm ± 0.5 Nm | | **ESD precautions to be respected** |
| 8.1.1.9 | | | | |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.2 Grounding of HIFI WU's

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.2.1.1 | Installation of grounding straps from HIFI WU's to side panel 1:<br>• LCU<br>• LSU Simulator<br>• HRH<br>• WOH<br>• WEH<br>and to side panel 2:<br>• FCU<br>• ICU<br>Screw down of HIFI grounding straps fixation screws with defined torque<br>Torque to be applied<br>Marking of fixation screws after application of defined torque | M5 - 3.8 Nm ± 0.3 Nm | | **ESD precautions to be respected** |
| 8.2.1.2 | Perform grounding verification measurement between HIFI WU's housings and side panel 1 resp. side panel 2<br>Documentation of measured values of side panel 1:<br>• LCU<br>• LSU SIMULATOR<br>• HRH<br>• WOH<br>• WEH<br>and of side panel 2:<br>• FCU<br>• ICU<br>Use bonding measurement device Metrawatt with Kelvin probes in four wire measurement technique and 1 amp measurement current | ≤ 2.5 mOhm | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.3 Installation of HIFI Warm Units Interconnecting Harness

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.3.1.1 | Pre-installation and definition of routing of HIFI WU's interconnecting harness on side panel 1 and side panel 2.<br>Copy positions of cable tie anchors onto side panel 1 and side panel 2 | | | |
| 8.3.1.2 | Fixation of cable tie anchors on side panel 1 and side panel 2 according marked positions of step before | | | |
| 8.3.1.3 | Final fixation of HIFI interconnecting harness on side panel 1 and side panel 2 | | | |
| 8.3.1.4 | Make contact of HIFI warm units interconnecting harness with WU's. To be performed by HIFI instrument representative | | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.4 HIFI WU's Bench Test

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.4.1.1 | **General Remark:**<br>HIFI stand alone test will be performed with instrument provided EGSE and procedure SRON-U/HIFI/PR/2004-007 | | | Test can be performed with side panel away or side panel installed onto SVM simulator |
| 8.4.1.2 | If side panel 1 is not installed perform installation of side panel 1 onto SVM simulator.<br>For movement use facility crane and standard hoisting slings.<br>Screw down side panel 1 onto SVM simulator (-Y axis)<br>• application of defined torque. Torque to be applied | M8 - 15 Nm ± 0.5 Nm | | |
| 8.4.1.3 | If side panel 2 is not installed perform installation of side panel 2 onto SVM simulator.<br>For movement use facility crane.<br>Screw down side panel 2 onto SVM simulator (-Y, -Z)<br>• application of defined torque. Torque to be applied | M8 - 15 Nm ± 0.5 Nm | | |

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|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.5 Mechanical Integration of PACS Warm Units (WU's)

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.5.1.1 | Perform incoming inspection of PACS WU's incl. PACS WU's interconnecting harness:<br>• cleaning and cleanliness inspection of ext. surfaces<br>• visual inspection<br>• completeness of documentation (ADP) | | | |
| 8.5.1.2 | Remove side panel 4 (Y, -Z) from SVM simulator structure and place panel on adequate support to allow comfortable access for WU's integration | | | |
| 8.5.1.3 | Ensure acceptable grounding of side panels before WU's integration | | | |
| 8.5.1.4 | Preinstall the following PACS WU's on side panel 4:<br>• BOLC<br>• DEC/MEC<br>• DPU<br>• SPU<br>All screws hand tight | | | **ESD precautions to be respected** |
| 8.5.1.5 | Adapt grounding straps from each PACS WU to side panel 4 and copy grounding strap I/F hole on side panel | | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.5.1.6 | Perform drilling of marked grounding strap I/F holes in side panel 4. For drilling remove PACS WU's from side panel. Use vacuum cleaner. | | | **ESD precautions to be respected** |
| 8.5.1.7 | Perform cleaning of side panel 4 with IPA and lint free rags | | | |
| 8.5.1.8 | Final mech. installation of PACS WU's on side panel 4:<br>• BOLC<br>• DEC/MEC<br>• DPU<br>• SPU<br>Screw down of PACS WU's fixation screws with defined torque<br>Torque to be applied<br>Marking of fixation screws after application of defined torque | <br><br><br><br><br><br>M5 - 3.8 Nm ± 0.3 Nm<br>M6 - 5.0 Nm ± 0.5 Nm | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.6 Grounding of PACS Warm Units (WU's)

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.6.1.1 | Installation of grounding straps from PACS WU's to side panel 4:<br>• BOLC<br>• DEC/MEC<br>• DPU<br>• SPU<br>Screw down of HIFI grounding straps fixation screws with defined torque<br>Torque to be applied<br>Marking of fixation screws after application of defined torque | M5 - 3.8 Nm ± 0.3 Nm | | **ESD precautions to be respected** |
| 8.6.1.2 | Perform grounding verification measurement between PACS WU's housings and side panel 4<br>Documentation of measured values:<br>• BOLC<br>• DEC/MEC<br>• DPU<br>• SPU<br>Use bonding measurement device Metrawatt with Kelvin probes in four wire measurement technique and 1 amp measurement current | ≤ 2.5 mOhm | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.7 Installation of PACS Warm Units Interconnecting Harness

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.7.1.1 | Pre-installation and definition of routing of PACS WU's interconnecting harness onto side panel 4<br>Copy positions of cable tie anchors onto side panel 4 | | | |
| 8.7.1.2 | Fixation of cable tie anchors on side panel 4 according marked positions of step before | | | |
| 8.7.1.3 | Final fixation of PACS interconnecting harness on side panel 4 | | | |
| 8.7.1.4 | Make contact of PACS warm units interconnecting harness with WU's. To be performed by PACS instrument representative | | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.8 PACS WU's Bench Test

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.8.1.1 | **General Remark:**<br>PACS stand alone test will be performed with instrument provided EGSE and procedure PACS-ME-TP-0016 | | | Test can be performed with side panel away or side panel installed onto SVM simulator |
| 8.8.1.2 | If side panel 4 is not installed perform installation of side panel 4 onto SVM simulator.<br>For movement use facility crane and standard hoisting slings.<br>Screw down side panel 4 onto SVM simulator (Y/ -Z xis)<br>• application of defined torque. Torque to be applied | M8 - 15 Nm ± 0.5 Nm | | |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.9 Mechanical Integration of SPIRE Warm Units (WU's)

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.9.1.1 | Perform incoming inspection of SPIRE WU's incl. SPIRE WU's interconnecting harness:<br>• cleaning and cleanliness inspection of ext. surfaces<br>• visual inspection<br>completeness of documentation (ADP) | | | |
| 8.9.1.2 | Remove side panel 3 (-Z) from SVM simulator structure and place panel on adequate support to allow comfortable access for WU's integration | | | |
| 8.9.1.3 | Ensure acceptable grounding of side panels before WU's integration | | | |
| 8.9.1.4 | Preinstall the following SPIRE WU's on side panel 3:<br>• DCU<br>• FCU<br>• DPU<br>All screws hand tight | | | **ESD precautions to be respected** |
| 8.9.1.5 | Adapt grounding straps from each SPIRE WU to side panel 3 and copy grounding strap I/F hole on side panel | | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.9.1.6 | Perform drilling of marked grounding strap I/F holes in side panel 3. For drilling remove SPIRE WU's from side panel. Use vacuum cleaner. | | | **ESD precautions to be respected** |
| 8.9.1.7 | Perform cleaning of side panel 3 with IPA and lint free rags | | | |
| 8.9.1.8 | Final mech. installation of SPIRE WU's on side panel 3:<br>• DCU<br>• FCU<br>• DPU<br>Screw down of SPIRE WU's fixation screws with defined torque<br>Torque to be applied<br>Marking of fixation screws after application of defined torque | M5 - 3.8 Nm ± 0.3 Nm<br>M6 - 5.0 Nm ± 0.5 Nm | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.10 Grounding of SPIRE Warm Units (WU's)

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.10.1.1 | Installation of grounding straps from SPIRE WU's to side panel 3:<br>• DCU<br>• FCU<br>Screw down of SPIRE grounding straps fixation screws with defined torque<br>Torque to be applied<br>Marking of fixation screws after application of defined torque | M5 - 3.8 Nm ± 0.3 Nm | | **ESD precautions to be respected** |
| 8.10.1.2 | Perform grounding verification measurement between SPIRE WU's housings and side panel 3<br>Documentation of measured values:<br>• DCU<br>• FCU<br>• DPU<br>Use bonding measurement device Metrawatt with Kelvin probes in four wire measurement technique and 1 amp measurement current | ≤ 2.5 mOhm | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.11 Installation of SPIRE Warm Units Interconnecting Harness

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.11.1.1 | Pre-installation and definition of routing of SPIRE WU's interconnecting harness onto side panel 3<br>Copy positions of cable tie anchors onto side panel 3 | | | |
| 8.11.1.2 | Fixation of cable tie anchors on side panel 3 according marked positions of step before | | | |
| 8.11.1.3 | Final fixation of SPIRE interconnecting harness on side panel 3 | | | |
| 8.11.1.4 | Make contact of SPIRE warm units interconnecting harness with WU's. To be performed by SPIRE instrument representative | | | **ESD precautions to be respected** |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.12 SPIRE WU's Bench Test

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.12.1.1 | **General Remark:**<br>SPIRE stand alone test will be performed with instrument provided EGSE and procedure SPIRE-RAL-PRC-002422 | | | Test can be performed with side panel away or side panel installed onto SVM simulator |
| 8.12.1.2 | If side panel 3 is not installed perform installation of side panel 3 onto SVM simulator.<br>For movement use facility crane and standard hoisting slings.<br>Screw down side panel 3 onto SVM simulator (-Z xis)<br>• application of defined torque. Torque to be applied | M8 - 15 Nm ± 0.5 Nm | | |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.13 Integration of SIH Support Brackets to SVM Simulator Closure Panels

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.13.1.1 | **General Remark:** This activity have to be performed by use of the following dedicated documents:<br>• Herschel EQM Cryostat Harness SVM Internal SIH 2547-151430-300-01-0A | | | |
| 8.13.1.2 | Perform incoming inspection of SVM harness support brackets:<br>• cleaning and cleanliness inspection of ext. surfaces<br>• visual inspection<br>• completeness of documentation (ADP) | | | |
| 8.13.1.3 | Integration of all harness support brackets to SVM closure panels<br>Screw down of all SIH support bracket fixation screws with defined torque<br>Torque to be applied<br>Marking of fixation screws after application of defined torque | M6 - 5.0 Nm ± 0.5 Nm | | |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.14 Installation of SVM HIFI SIH from SVM Harness Brackets to HIFI Warm Units I/F's

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.14.1.1 | **General Remark:** This activity have to be performed by use of the following documents:<br>• Herschel PFM Cryostat harness SVM internal CCH & SIH HP-2-ASED-ID-0083-01-0A page 1-3 (use of EQM relevant information) | | | |
| 8.14.1.2 | Perform incoming inspection of SVM HIFI SIH:<br>• cleaning and cleanliness inspection<br>• visual inspection<br>completeness of documentation (ADP) | | | |
| 8.14.1.3 | **Installation/Routing of HIFI SIH from SVM harness brackets to HIFI WU's I/F's** | | | |
| 8.14.1.4 | Electrical verification of HIFI SIH and documentation of results | | | |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.15 Installation of External PACS SIH from SVM Brackets to PACS Warm Units I/F's

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| | **General Remark:** This activity have to be performed by use of the following documents:<br>• Herschel PFM Cryostat harness SVM internal CCH & SIH HP-2-ASED-ID-0083-01-0A page 5 (use of EQM relevant information) | | | |
| 8.15.1.1 | Perform incoming inspection of SVM PACS SIH:<br>• cleaning and cleanliness inspection<br>• visual inspection<br>completeness of documentation (ADP) | | | |
| 8.15.1.2 | **Installation/Routing of PACS SIH from SVM harness brackets to HIFI WU's I/F's** | | | |
| 8.15.1.3 | Electrical verification of PACS SIH and documentation of results | | | |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.16 Installation of External SPIRE SIH from SVM Brackets to SPIRE Warm Units I/F's

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.16.1.1 | **General Remark:** This activity have to be performed by use of the following documents:<br>• Herschel PFM Cryostat harness SVM internal CCH & SIH HP-2-ASED-ID-0083-01-0A page 4 (use of EQM relevant information) | | | |
| 8.16.1.2 | Perform incoming inspection of SVM SPIRE SIH:<br>• cleaning and cleanliness inspection<br>• visual inspection<br>completeness of documentation (ADP) | | | |
| 8.16.1.3 | Installation/Routing of SPIRE SIH from SVM harness brackets to HIFI WU's I/F's | | | |
| 8.16.1.4 | Electrical verification of SPIRE SIH and documentation of results | | | |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.17 Instrument WU's Bus and Power cabling integration on SVM lower panels for HIFI, PACS and SPIRE

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.17.1.1 | **General Remark:** This activity have to be performed by use of the following documents:<br>• HIFI 1 HP-NXH-DW-1024 page 1-3<br>• HIFI 2 HP-NXH-DW-1023 page 1-4<br>• PACS HP-NXH-DW-1021 page 1-4<br>• SPIRE HP-NXH-DW-1022 page 1-5<br>• H-P-2-ASPI-SP-0902 page 16 HIFI 1553-A-Bus<br>Page19 HIFI 1553-B-Bus<br>Page10 PACS 1553-A-Bus<br>Page13 PACS 1553-B-Bus<br>Page 22 SPIRE 1553-A-Bus<br>Page 25 SPIRE 1553-B-Bus | | | |
| 8.17.1.2 | Mechanical integration of the following EGSE Connector brackets<br>SPIRE panel: bracket DB04<br>HIFI panel 1: bracket DB06<br>HIFI panel 2: bracket DB05<br>PACS panel: bracket DB31 and bracket DB32 | | | |
| 8.17.1.3 | Integration of SPIRE bus and power cabling | | | |
| 8.17.1.4 | Integration of HIFI bus and power cabling | | | |
| 8.17.1.5 | Integration of PACS bus and power cabling | | | |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

## 8.18 Instrument WU's electrical integration Procedure with IDAS

| Step | Activity | Nominal Value | Actual Value | Remarks |
|---|---|---|---|---|
| 8.18.1.1 | **General Remark:** This activity have to be performed by use of the following documents:<br>• HIFI WU electrical integration Procedure with IDAS HP-2-ASED-TP-0058<br>• SPIRE WU electrical integration Procedure with IDAS HP-2-ASED-TP-0055<br>• PACS WU electrical integration Procedure with IDAS HP-2-ASED-TP-0057 | | | |
| 8.18.1.2 | Perform instrument WU's testing:<br>HIFI WU's according HP-2-ASED-TP-0058<br>PACS WU's according HP-2-ASED-TP-0057<br>SPIRE WU's according HP-2-ASED-TP-0055 | | | |
| 8.18.1.3 | After successful HIFI WU's electrical integration test make contact between HIFI WU's and EGSE | | | |
| 8.18.1.4 | After successful PACS WU's electrical integration test make contact between PACS WU's and EGSE | | | |
| 8.18.1.5 | After successful SPIRE WU's electrical integration test make contact between SPIRE WU's and EGSE | | | |

| | | |
|---|---|---|
| Date:<br><br>Sequence started at: | <br><br>Completed at: | Test Conductor:<br><br>AIT QA: |

END OF DOCUMENT

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