

HERSCHEL DPU_s/ICU

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REGISTRAZIONE DELLE MODIFICHE / CHANGE RECORD

EDIZIONE ISSUE	DATA DATE	AUTORIZZAZIONE CHANGE AUTHORITY	OGGETTO DELLA MODIFICA E SEZIONI AFFETTE REASON FOR CHANGE AND AFFECTED SECTIONS
1	23/01/2006		First Issue.
2	10/05/2006		Updated according to MoM dated 08/05/2006 (added three shock indicators at every unit), modified cap. 7.2 pag.12.



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1. SCOPE

This document describes the criteria and actions that should be followed during handling, transportation and storage of the HERSCHEL ICU and DPU PFM Units to prevent damage or degradation.

Moreover this document gives information on how to correctly store, pack and ship the unit.

2. DOCUMENTS

2.1 APPLICABLE DOCUMENTS

AD	Document Number	Issue/Date	Title
1	SCI-PT-IIDA-04624	Issue 3.3 30/06/04	Herschel/Planck Instrument Interface Document IID Part A
2	SCI-PT-IIDB/HIFI-02125	Issue 3.2 05/03/04	Herschel/Planck Instrument Interface Document IID Part B – Instrument "HIFI"
3	SCI-PT-IIDB/PACS-02126	Issue 3.3 draft 2 12/07/04	Herschel/Planck Instrument Interface Document IID Part B
4	SCI-PT-IIDB/SPIRE-02124	Issue 3.3 21/06/04	Herschel/Planck Instrument Interface Document IID Part B

2.2 REFERENCE DOCUMENTS

RD	Document Number	Issue/Date	Title
1	HERS-GEN-PL-CGS-002	Issue 2 23/06/05	Herschel DPUs/ICU Product Assurance Plan



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3. ACRONYMS

AD	Applicable Documents
ADP	Acceptance Data Package
CGS	Carlo Gavazzi Space
CI	Configuration Item
ESD	Electro-Static Discharge
HW	Hardware
I/F	Interface
ICD	Interface Control Document
P/N	Part Number
PA	Product Assurance
PFM	Proto-Flight Model
QA	Quality Assurance
RD	Reference Document
S/N	Serial Number



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4. HANDLING AND TRANSPORTATION

4.1 GENERAL

All the handling and transportation activities of the equipment given in the next paragraphs shall meet the following requirements:

- Handling and transportation shall be performed by authorized personnel and qualified in accordance with this procedure.
- The equipment shall always be transported using the related transport container, with the protections foreseen in the next paragraphs to prevent shocks and to protect against hostile environmental conditions.
- The transport container shall be opened only in a clean room, as described hereafter.
- The unit shall always be kept in a clean room when out of its transport container.

4.2 HANDLING PROCEDURES

4.2.1 ESD-PROTECTION

To prevent ESD phenomena from damaging the unit, the following recommendations shall be carefully followed during the installation, test and storage of the equipment.

- The connectors protection caps shall be intact throughout the storage period, prior to the installation
- The personnel who is in charge of handling and transportation shall follow the instructions given in §4.4.
- The packaging of the unit shall be identified with 'ESD-sensitive content' markings.

The unit shall be powered only when grounded by means of the dedicated bonding stud and possibly by a secondary grounding point.

4.2.2 CONNECTORS PROTECTION

The unit shall be handled and stored with red plastic dust caps installed on all connectors.

4.2.3 ENVIRONMENTAL CONDITIONS – CLOSED UNIT

The unit shall be stored within its dedicated transport container, in the foreseen storage configuration and in an environmentally controlled area, in accordance with [AD2, AD3 and AD4] conditions.

The unit shall be operated in a similarly controlled area. The environmental conditions indicated in Table 4-1 shall be kept during the whole period of operation, except for dedicated environmental test (to be executed according to AD2, AD3 and AD4).

	Min.	Max.	
Temperature	16	30	°C
Humidity	30	60	%
Atmospheric pressure	959	1048	mbar
Cleanliness	100'000 or better		ppm

Table 4-1 Environmental conditions

The environmental conditions indicated in Table 4-1 are to be respected during all the activities to be performed on the PFM Units also after the delivery from CGS to ASI (OBS upgrade, ...) . The unit shall not be exposed to under-pressure except for dedicated environmental test.



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4.2.4 ENVIRONMENTAL CONDITIONS – OPEN UNIT

In the scope of contamination control the unit shall be opened only in a clean area, at least Class 100.000, and environmental conditions better or equal to the following environment.

	Min.	Max.	
Temperature	16	30	°C
Humidity	30	60	%
Atmospheric pressure	959	1048	mbar

The unit shall not be let open for more than 15min. when not kept in this type of environment. Areas where dust or particle contamination is possible must be absolutely avoided.

4.2.5 I/F-CONDITIONS DURING OPERATION

When not in its transport container and during operation, the unit shall be installed horizontally on a clean surface, as shown in fig 4.2-1.

Non specified areas can be touched during handling but with caution and without expose them to excessive pressure.

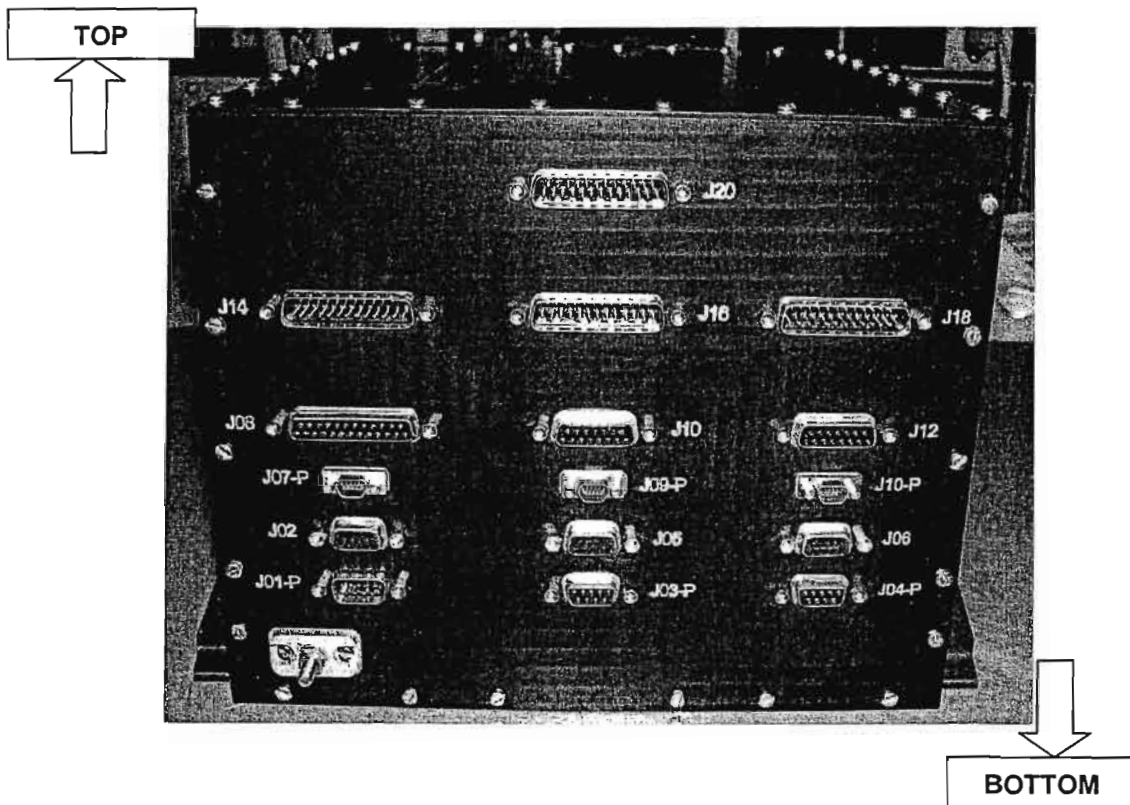



Figura 4.2-1: ICU/DPUs unit in closed configuration.

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4.3 TRANSPORT CONFIGURATION

The unit shall be transported within the dedicated transport container p/n:LRO0324xxx supplied by DAHER LHOTELLIER C.S.I..

The unit shall be positioned in the transport container with the cover put on the bottom cushion of the container.

The I/F-connectors shall be protected by caps and I/F bolts shall be removed.

The transport container shall be transported in up-right position in accordance with the sign 'TOP' indication marked on the side of the container. The transport container shall not be exposed to direct sunlight or rain. The transport container shall be transported and stored under the environmental conditions defined in chapter 6. The transport container is not thermally controlled.

The container is in polyethylene box. The container displays six robust closures, lockable via iron wire and sealing wax, and two lateral handles for transport. The unit is held with pre-cut foam plates in position. Foam plates are made from polyethylene at closed pores.

The transport container has a dry weight of 7.3 kg (with foam) and external dimensions of 50 x 50 x 30 cm

4.4 INSTRUCTIONS FOR PERSONNEL

The personnel, which is in charge of handling and transportation of the unit shall:

- 1) Remove every connection wire before moving the unit.
- 2) During the handling of the unit outside its own transport container
 - Wear cotton or nylon gloves
Gloves shall be clean
Gloves made of PVC and any other materials causing static discharge shall not be used
The gloves shall be timely changed to avoid that the hand perspiration could leave finger prints on the unit
 - Wear overall headgear and shoes cover suitable for the cleanliness level of the room and appropriate to avoid ESD.
 - Wear grounding wrist laces
 - Be electrically connected to the ground
- 3) During the handling of the unit inside its own transport container
 - If transport and handling occurs in a clean room environment, the same recommendations as 2) apply
 - In any case, carry the container in such a way as to prevent damage and shock to the equipment.


5. PACKING

5.1 GENERAL

The unit will be packaged to prevent deterioration, corrosion, physical damage, contamination and ESD damage. Packaging procedures and instructions will be provided for protection during transport.

When specific handling environments are necessary, these shall be considered in the packing design and necessary environmental requirements will be controlled on the exterior of the package by means of proper monitor/recording/indicators under QA control and responsibility.

Packaging operations shall be monitored and controlled by the responsible QA personnel.

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5.2 DESICCANTS

Desiccants shall be used to preserve the required level of humidity inside shipping container. The amount of silica gel shall be determined analytically and controlled by PA. Silica-gel shall be completely enclosed inside its dedicated packet in order to avoid any contamination with flight hardware.

5.3 PROTECTION AGAINST PHYSICAL DAMAGE

Cushioning material is used between the unit and the outer container. The cushion material is cellular ethylene foam, cut to the form of the unit external envelope.

The equipment shall be sealed with an anti-static plastic bag against humidity. The equipment shall be positioned enclosed into the transport bag into the receptacle cut into the cushions.

5.4 PACKAGING MATERIAL

The following requirements apply to the materials used for the protection and packing .

- They shall not be inclined to surface deterioration, in order to avoid particle contamination of the unit.
- They shall avoid scratches or physical damage to the item
- They shall display non-corrosive behavior
- They shall be non-ESD inclined

5.5 PACKAGING SEQUENCE

- 1) Put protection caps on unit connectors
- 2) Seal the unit in an anti-static bag.
- 3) Open transport container.
- 4) Put the unit with the cover on the bottom cushion of the container.
- 5) Place the top cushion of the container over the unit.
- 6) Close the container and lock it.

5.6 UNPACKING SEQUENCE

Follow the same procedure as in §5.5 in reverse order.


6. STORAGE

6.1 STORAGE CONDITIONS

The unit shall be stored in environmentally-controlled and limited-access area. Before the unit is stored, a visual inspection ensures that proper packaging, identification and labeling are met.

Marking and labeling of the unit shall prevent any misinterpretation or error in identification.

The unit shall be stored within the unit transport container, in controlled conditions, adequately packed according to the packing procedure indicated in § 5.

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The following storage conditions shall be maintained during the whole storage time.

	Min.	Max.	
Temperature	16	30	°C
Humidity	30	60	%
Atmospheric pressure	959	1048	mbar
Cleanliness	100'000 or better		ppm

When extracted from the transport container and its transport bag, the unit shall be kept within the following conditions.

	Min.	Max.	
Temperature	16	30	°C
Humidity	30	60	%
Atmospheric pressure	959	1048	mbar
Cleanliness	100'000 or better		ppm

7. IDENTIFICATION AND WARNINGS

7.1 MARKING

Identification and warning marking shall be attached to the outer protective cover and shall be reproduced on the container. The language used shall be the English language (except the address) for international shipment.

The marking shall contain the following information:

IDENTIFICATION

- Name and address of addressee
- Name and address of supplier
- Description of contents including serial number (where applicable)
- Notice about Acceptance Data Package inclusion (if included)

WARNING NOTICE

- Clear indication of the correct position of the package (see Fig. Figure 7.1-1: Identification & warning symbols)
- Indication about environmental conditions (see Fig. Figure 7.1-1: Identification & warning symbols)
- "Handle with Care" (see Fig. Figure 7.1-1: Identification & warning symbols)

The symbols and formats normally used, are shown in the following figures:

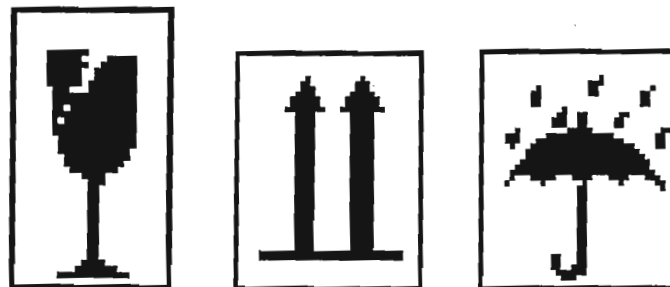


Figure 7.1-1: Identification & warning symbols



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7.2 SHOCK INDICATION

7.2.1 SHOCK INDICATORS

Three shock indicators shall be positioned on the unit inside the transport container as showed below (fig. 7.2-1) to monitor the shock history during transport. Shock indication shall be checked prior to shipment and at incoming inspection. The shock sensors shall be fixed with their adhesive pads to the external walls of the unit for means of SCOTCH 92 (Polymide KAPTON tape with silicone adhesive). For sensor location see fig. 7.2-2, fig. 7.2-3 and fig. 7.2-4. One shock indicator shall be positioned on the transport container as showed below (fig. 7.2-1) to monitor the shock history during transport. Shock indication shall be checked prior to shipment and at incoming inspection. The shock sensor shall be fixed with their adhesive pad to the external wall of the transport container.

All shock sensors threshold shall be 20g.

In case the shock indicator are red, the items shall be inspected for damage and actions shall be discussed with CGS.



Figure 7.2-1: Shock indicator

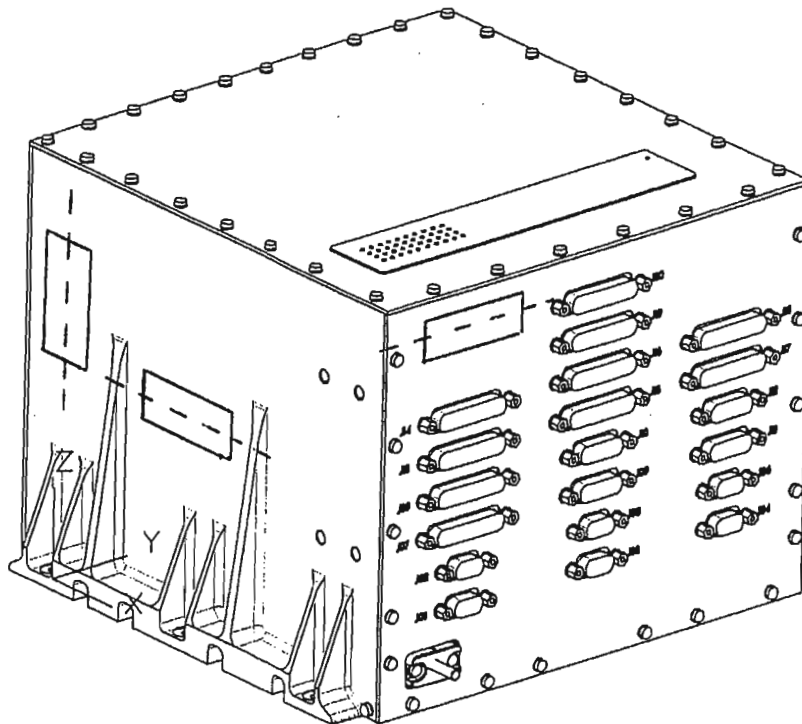


Figure 7.2-2: HIFI sensor position



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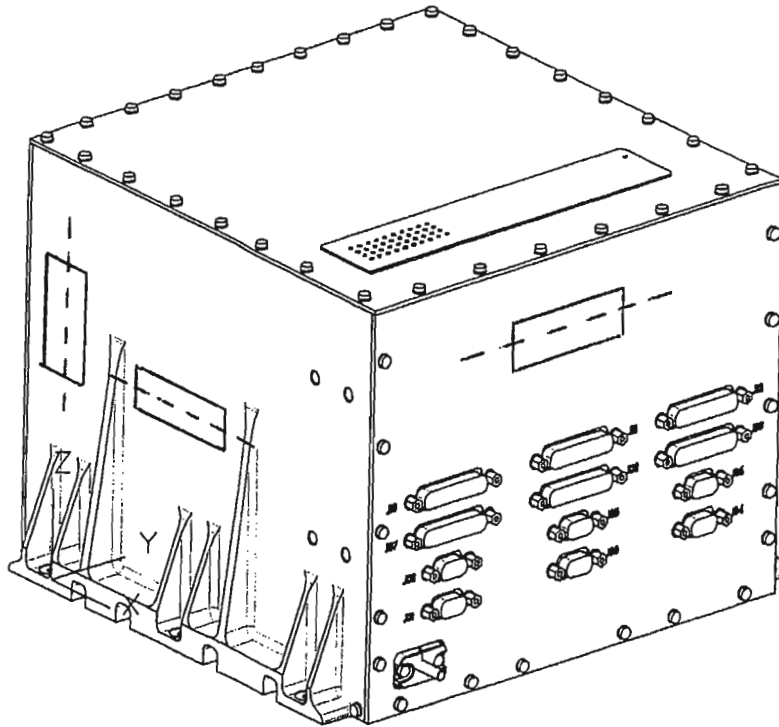


Figure 7.2-3: SPIRE sensor location

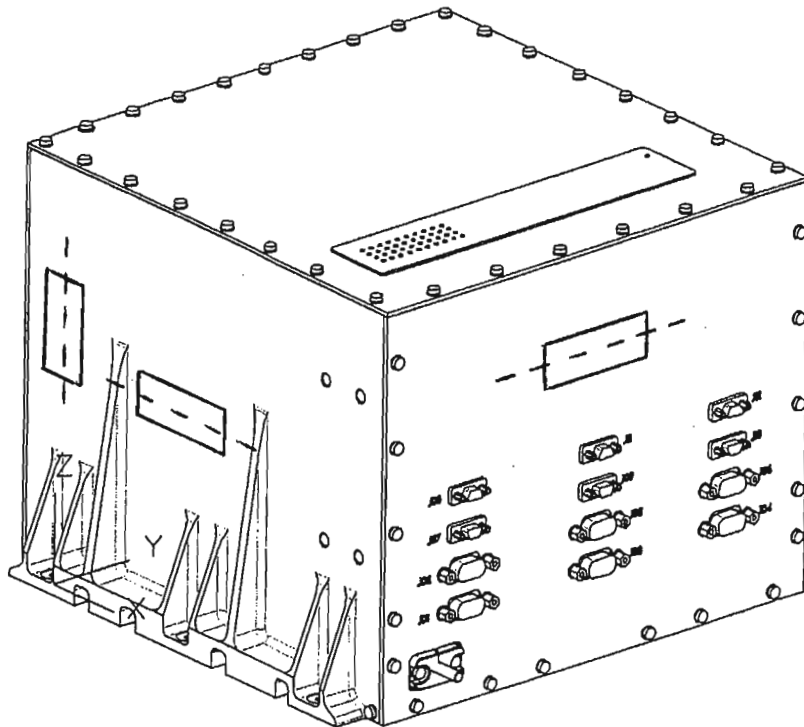


Figure 7.2-4: PACS sensor location