

Title: **Herschel Cryo-Harness Inputs to Thermal Analysis**

CI-No: 121430

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Issue	Date	Sheet	Description of Change	Release
Draft	27.09.01	-all-	First issue	
1	14.02.02	-all-	New issue, Document update based on IIDB's issue 2 and further clarifications concerning instrument nominal current , duty-cycles and incorporation of harness branch length.	
	18.03.02	16	add remark for column "R_cable Ohm/m at 300 K	
		22	add remark for column "R_cable Ohm/m at 300 K	
		28	add remark for column "R_cable Ohm/m at 300 K	
		31	cable_ID I10 line 1, 6, 7, change duty-cycle	
		32	cable_ID I12 line 1, 6, 7, change duty-cycle	
		33	cable_ID C3 line 3 change I_nominal(A)	
		34	cable_ID C10 line 1 change duty-cycle	
		35	cable_ID C12 line 2 change duty-cycle	
1.1	08.05.02	18	Implementation of red-lined document. Ref.: HI-FI I/F Meeting HP-2-ASED-MN-0114	
		30	Implementation of red-lined document. Ref.: PACS I/F Meeting HP-2-ASED-MN-0111	
		37	Implementation of red-lined document. Ref.: SPIRE I/F Meeting HP-2-ASED-MN-0112	

Issue	Date	Sheet	Description of Change	Release
2.0	20.10.03	03	Update introduction	
		04	Update of A2, AD3 and RD6 Add RD7, RD8 and RD9	
		05	Update General Remarks	
		10-23	Add new Interconnection Diagram for CCH Harness Update of Cryo-Harness tables for CCH	
		25-38	Add new Interconnection Diagram for HIFI Harness Update of Cryo-Harness tables for HIFI SIH	
		39-51	Add new Interconnection Diagram for PACS Harness Update of Cryo-Harness tables for PACS SIH	
		52-61	Add new Interconnection Diagram for SPIRE Harness Update of Cryo-Harness tables for SPIRE SIH	

1 Introduction

The Herschel instruments harness and cryo control harness data summarized within this document have been established as input to the thermal analysis.

The metallic amount of wire cores, served wire shield cable shields and harness branch overall shield strands have been calculated upon data available from GORE cable data sheets(GSC-05-82xxx-00). In addition the amount of wire and cable isolation materials as PTFE and Polyimid plastics of each single wire and cable configuration have been calculated.

. The HERSCHEL harness wire and cable type list is provided in §3.4

With SVM and PLM harness lay-outs a harness routing design have been established upon available schematics, structural CATIA 3D drawings. The design description as given in the instrument scientific instrument wiring lists and of the growing cryo control harness have been collected and summarized to get the data for this thermal analysis.

Based on the instrument IIDBs, agreed changes, dedicated instrument harness interface meetings, ICDs and data available from cryo control harness, advanced harness interconnecting diagrams have been established to support the harness lay-out as described herein.

Harness overall shields have been calculated with data as specified in RD 5, for the harness branches in between the warm unit and the CVV external feed-through plug connectors in accordance to RD 4.

2 Documents

2.1 Applicable Documents

- AD-1 Herschel/Planck Instrument Interface Document – Part B, SCI-PT-IIDB/SPIRE-02124, Issue 2/2, 01/07/02
- AD-2 Herschel/Planck Instrument Interface Document – Part B, SCI-PT-IIDB/PACS-02126, Issue 2/Rev.1 01/07/02
- AD-3 Herschel/Planck Instrument Interface Document – Part B, SCI-PT-IIDB/HIFI-02125, Issue 2/2, 26/06/02
- AD-4 PACS Cryo-Harness Interface Meeting
HP-2-ASED-MN-0111
- AD-5 SPIRE Cryo-Harness Interface Meeting
HP-2-ASED-MN-0112
- AD-6 HIFI Cryo-Harness Interface Meeting
HP-2-ASED-MN-0114
- AD-7 HIFI LOU Cryo-Harness Interface Meeting
HP-2-ASED-MN-0123

2.2 Reference Documents

- RD-1 ESA / SCC Detailed Specification for ISO-K-101 issue: 2 cables
- RD-2 Herschel SVM SCI-PT-IIDA-04624 Fig. 4.5.3-1
- RD-3 Mail from Mr.B.Collaudin dd: 3.7.01 Evolution of SVM Warm units
- RD-4 Fax from Alcatel HP-ASPI-LT-902 dd: 01.02.02
- RD-5 ISO Manufacturing Document ISO-LI-BE000.001 Issue: 2 Rev.1
- RD-6 GORE datasheet of Tubular Manganin Braid type GSC-05-82569-00,
GSC-05-82570-00 and GSC-05-82484-00
- RD-7 HIFI CR 0033 Vers. 2 and HIFI CR oo52
- RD-8 PACS MA-SP-0001 Iss. 3.2 PACS CRYO Harness Specification
- RD-8 SPIRE RAL PRJ 000608 Issue 1.1 Herschel SPIRE Harness Definition
- RD-9 SPIRE-RAL-NOT-001819 issue: 3.0 SPIRE HDD 1.1 Deltas
- RD-10 Cryo Harness Wires and Cable Configuration HP-2-ASED-DS-0001 Iss. 1

RD-11 SPIER RAL PRJ 000608 Iss. 1.1 Herschel SPIRE Harness Definition

3 General Remarks

3.1 Instrument Harness Tables

Harness cable data from GORE have been used to calculate the amount of stainless steel and plastics within the various cable configurations.

Cable types specified in AD 1 to AD7 have been used. The number of conductors identified, have been calculated properly without additional spares, to get the current amount of SST, Brass and plastics within all instrument harness branches.

Electrical and duty cycle data as required in AD-1 to AD-7 have been incorporated accordingly. Data taken from different sources are identified for traceability. The former maximum currents specified in AD1 to AD 7 for the harness wire and cable design have been in accordance to latest data provided by the instruments. To calculate harness dissipations according in orbit instrument profiles, which identify the single powered unit and the current within the total subject harness branch wires during that profile the average current and correlated duty cycle data have been implemented.

These data are specified within AD-1 to AD-7 harness data tables.

2.3 Cryo Control Harness (CCH) Tables

Data of the Herschel Cryo control harness have been calculated by use of latest data about the amount of Cryo control components (CCC`s) identified and harness cables from GORE. The current available data of the Cryo instrumentations have been implemented too.

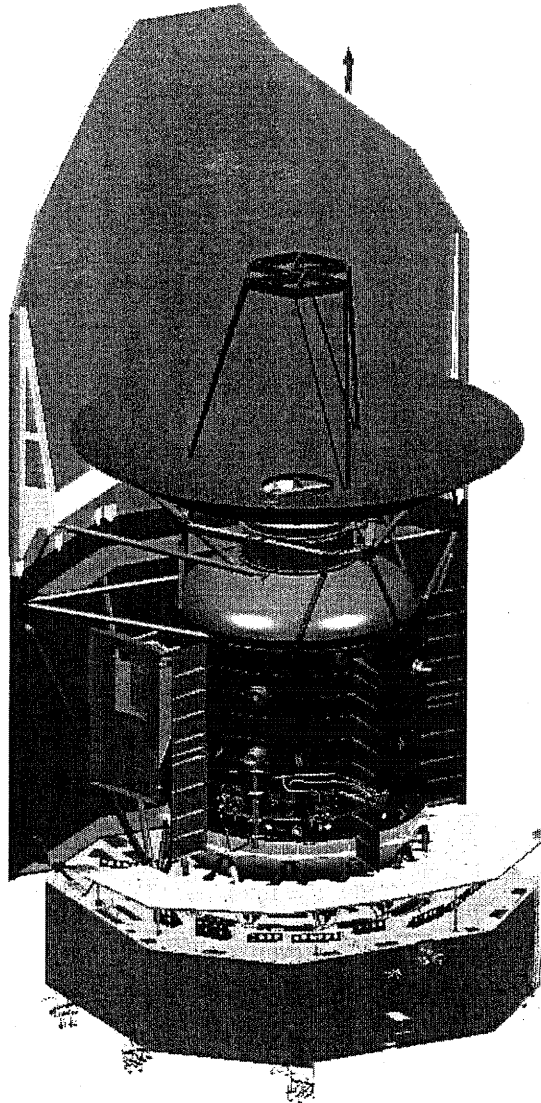
2.4 Harness Interface Connector-Brackets (I/F-CB`s)

The Cryo Harness design for SIH and CCH is based on the following harness segments as they are:

Warm unit output	to	SVM I/F-CB receptacle-connectors
SVM I/F-CB plugs	to	CVV external plug-connectors
CVV internal vacuum feed-throughs	to	OB unit plug-connectors

There will be no OB I/F-CB on the optical bench (OB)

Individual connector-brackets of small size will be used in case of harness wire splices which can be placed on the OB only. (not yet identified).



2.5 Harness Wire and cable types

The wire and cables as specified in RD1 are currently in update for the HERSCHEL Cryo harness use. All wire and cable types specified within AD1 to AD7 have been summarised in table below.

Table 3.4-1: HERSCHEL Cryo Harness wires and cables

ISO_K_101	Gore_cab1	Herschel Cable_Abbreviations	Cab_Wire	Res_Ohm_m	mass_g_m
	H01030B0	1-core, no-Shield, core-size AWG 30, core-Brass	1C	2,2	
	H01038B0	1-core, no-Shield, core-size AWG 38, core-Brass	1C	12,0	
	H01038S0	1-core, no-Shield, core-size AWG 38, core-SST	1C	140,0	
6775_Rev2	H01138S0	1-core, 1-Shield, core-size AWG 38, core-Shield-SST	1S1C	140,0	0,73
SVM	H01138B0	1-core, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S1C	140,0	0,73
	H01238SS	1-core, 2-isolated Shields, core-size AWG 38, core-Shield-SST (PACS TRIAX)	2S1C	140,0	
SVM	H01238BS	1-core, 2-isolated Shields, core-size AWG 38, core-Brass, Shield-SST (PACS TR	2S1C	140,0	
6779_Rev3	H02030B0	2-cores, no-Shield, core-size AWG 30, core-Brass	T2C	2,2	1,38
6779_Rev3a	H02030B0	2-cores, no-Shield, core-size AWG 30, core-Brass, 3a>red-isol+PI	T2C	2,2	1,72
6778_Rev3	H02038B0	2-cores, no-Shield, core-size AWG 38, core-Brass	T2C	12,0	0,37
6778_Rev3a	H02038B0	2-cores, no-Shield, core-size AWG 38, core-Brass, 3a>red-isol+PI	T2C	12,0	0,63
6777	H02038S0	2-cores, no-Shield, core-size AWG 38, core-SST	T2C	140,0	0,36
	H02138BS	2-cores, 1-Shield, core-size AWG 30, core-Brass, Shield-SST	1S2TC	2,2	
	H02138BS	2-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S2TC	12,0	
6786_Rev3	H02138SS	2-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S2TC	140,0	1,75
6789	H03138BS	3-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S3C	12,0	2,00
6788_Rev3	H03138SS	3-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S3C	140,0	2,00
	H04030B0	4-cores, no-Shield, core-size AWG 30, core-Brass	T4C	2,2	
6783_Rev3	H04038B0	4-cores, no-Shield, core-size AWG 38, core-Brass	T4C	12,0	0,74
6782	H04038S0	4-cores, no-Shield, core-size AWG 38, core-SST	T4C	140,0	0,72
6796	H04138BS	4-cores, 1-Shield, core-size AWG 30, core-Brass, Shield-SST	1S4C	12,0	2,26
6795_Rev3	H04138SS	4-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S4C	140,0	2,22
	H05138SS	5-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S5C	140,0	
SVM	H05138BS	5-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S5C	140,0	
	H06130BS	6-cores, 1-Shield, core-size AWG 30, core-Brass, Shield-SST	1S6C	2,2	
	H06138SS	6-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S6C	140,0	
SVM	H06138BS	6-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S6C	140,0	
	H07138BS	7-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S7C	12,0	
6790_Rev3	H07138SS	7-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S7C	140,0	3,90
	H08130BS	8-cores, 1-Shield, core-size AWG 30, core-Brass, Shield-SST	1S8C	2,2	
	H08138SS	8-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S8C	140,0	3,90
SVM	H08138BS	8-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S8C	140,0	3,90
6792_Rev4	H11138SS	11-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S11C	140,0	4,20
	H12138BS	12-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S12C	140,0	
	H12138SS	12-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S12C	140,0	
	H15138SS	15-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S15C	140,0	
	H16138SS	16-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S16C	140,0	
SVM	H16138BS	16-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S16C	140,0	
6793_Rev4	H19138SS	19-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S19C	140,0	6,10
SVM	H19138BS	19-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S19C	140,0	6,10
	H23138SS	23-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S23C	140,0	
	H24138SS	24-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S24C	140,0	
SVM	H24138BS	24-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S24C	140,0	
6802	H26138SS	26-cores, 1-Shield, core-size AWG 38, core-Shield-SST	1S26C	140,0	8,25
SVM	H26138BS	26-cores, 1-Shield, core-size AWG 38, core-Brass, Shield-SST	1S26C	140,0	8,25
	H12-020138SS	12x 2-cores, unshielded, core-size AWG 38, 1-Overall-Shield, core-Shield-SST		140,0	
SVM	H12-020138BS	12x 2-cores, unshielded, core-size AWG 38, 1-Overall-Shield, core-Brass, Shield-SST		140,0	
7525	H05-071138SS	5x 7-cores, shielded, core-size AWG38, 1-Overall-Shield, core-Shields-SST		140,0	25,00

■ Wire and cables defined by Instruments

■ Wires and cables defined by Astrium

Remark:
Die Multicore-Cables with 1-4 Cores, then 6-, 8-, 12-, 16-, 19-, 24-, 26-, and the special 12x TP under 1 cable shield are current preferred configurations.

Note: The cable type H12-020138SS and H12-020138BS have been changed to configuration H04-030138SS and H04-030138BS (4 times 3-wires twisted, with 1-Overall-Shield, core-Brass or core-SST, Shield-SST.). Based on the SPIRE ECR-0039 version 3, CVV internal 3 double-shielded cables have been developed and CVV external, double over-shielded harness branches will be used.

2.6 Harness Length

For harness length calculations, determinations performed on the CATIA model have been taken into account.

All harness lengths are calculated CATIA length with an additional cable length of 0,3 m.

The cable lengths are shown in the Cryo Harness Tabela of CCH, HIFI, PACS and SPIRE. See ANNEX 1 to 7 .

4 Annex 1: Cryo Control Harness CCH

References:

Nominal currents and duty cycles (marked grey in the table)

Remarks:

for column "R_cable Ohm/m at 300 K :

All wires will be driven by the same average current.

Overall Harness Lay-out CCH

The Overall Layout between the warm and cold units is defined in the Herschel drawings

HP-2-ASED-ID-0088-01-0C CCH Upper Ring CVV

HP-2-ASED-ID-0088-02-0B CCH Lower Ring CVV

HP-2-ASED-ID-0088-03-0C CCH External Harness

5 Annex 2: HIFI Instrument Harness SIH

References:

Nominal currents and duty cycles (marked grey in the table)

Remarks:

for column "R_cable Ohm/m at 300 K :

All wires will be driven by the same average current.

Preliminary HIFI Harness Lay-out

The Overall Layout between the warm and cold units is defined in the Herschel drawings

HP-2-ASED-ID-0090-01-0B HIFI

6 Annex 3: PACS Instrument Harness SIH

References:

Nominal currents and duty cycles (marked grey in the table)

Remarks:

for column "R_cable Ohm/m at 300 K :

All wires will be driven by the same average current.

Preliminary PACS Harness Lay-out

The Overall Layout between the warm and cold units is defined in the Herschel drawings

HP-2-ASED-ID-0089-01-0B PACS

7 Annex 4: SPIRE Instrument Harness

References:

Nominal currents and duty cycles (marked grey in the table)

Remarks:

for column "R_cable Ohm/m at 300 K :

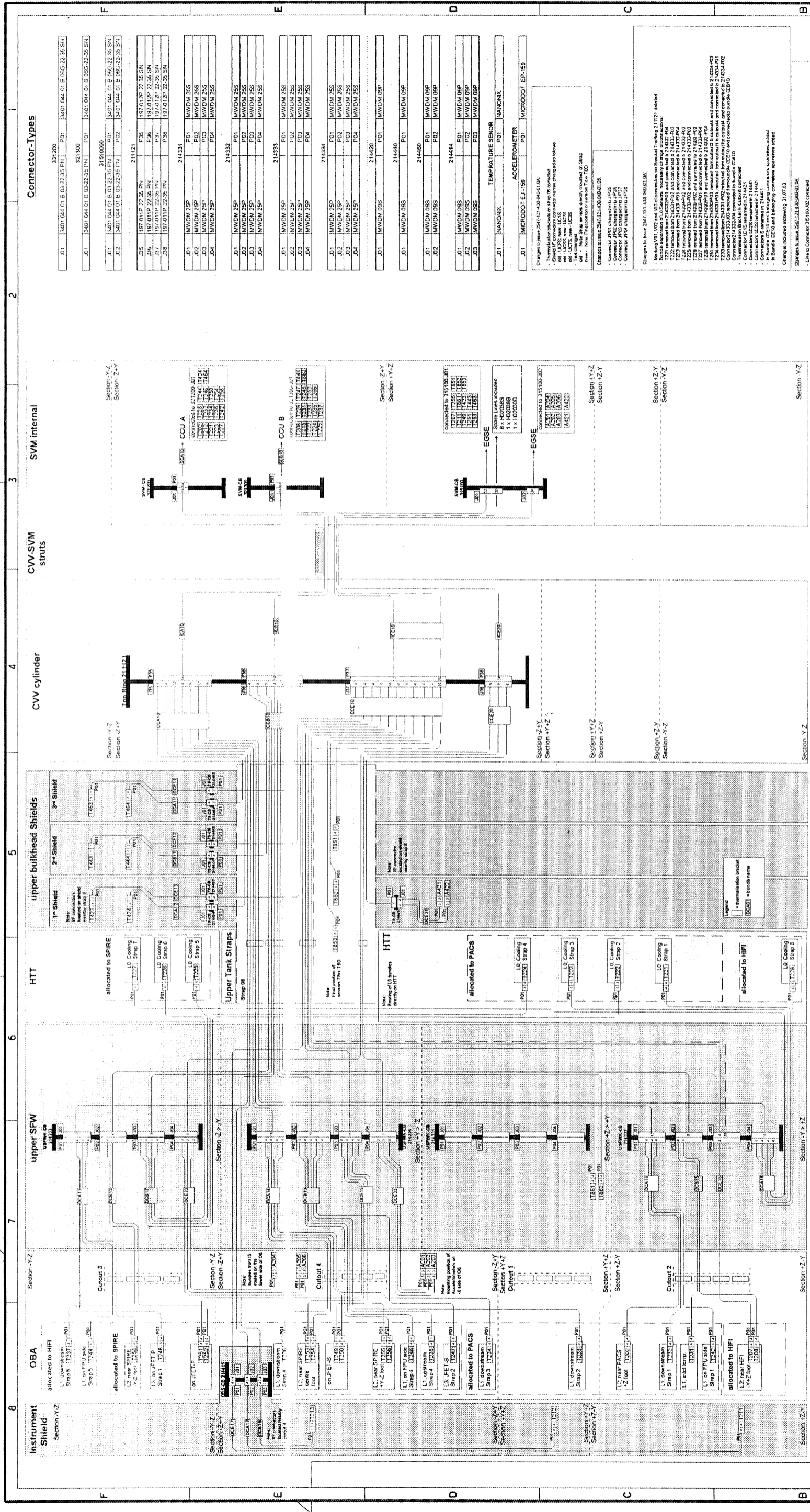
Harness bundling (actual 13 bundles) will be changed into 26 bundles,

All wires will be driven by the same average current.

Preliminary SPIRE Harness Lay-out

The Overall Layout between the warm and cold units is defined in the Herschel drawings

HP-2-ASED-ID-0091-01-0B SPIRE



Connector-Types	
J01	3401.044.01 B 03-22-35 PN P01 3401.044.01 B 065-22-35 SN
J01	3401.044.01 B 03-22-35 PN P01 3401.044.01 B 065-22-35 SN
3149.0000	
J01	3401.044.01 B 03-22-35 PN P01 3401.044.01 B 065-22-35 SN
J02	3401.044.01 B 03-22-35 PN P02 3401.044.01 B 065-22-35 SN
211121	
J05	197.0112 22.35 PN P05 197.0112 22.35 SN
J07	197.0112 22.35 PN P07 197.0112 22.35 SN
J08	197.0112 22.35 PN P08 197.0112 22.35 SN
214331	
J01	MWDM 25P P01 MWDM 25S
J02	MWDM 25P P02 MWDM 25S
J03	MWDM 25P P03 MWDM 25S
J04	MWDM 25P P04 MWDM 25S
214332	
J01	MWDM 25P P01 MWDM 25S
J02	MWDM 25P P02 MWDM 25S
J03	MWDM 25P P03 MWDM 25S
J04	MWDM 25P P04 MWDM 25S
214333	
J01	MWDM 25P P01 MWDM 25S
J02	MWDM 25P P02 MWDM 25S
J03	MWDM 25P P03 MWDM 25S
J04	MWDM 25P P04 MWDM 25S
214334	
J01	MWDM 25P P01 MWDM 25S
J02	MWDM 25P P02 MWDM 25S
J03	MWDM 25P P03 MWDM 25S
J04	MWDM 25P P04 MWDM 25S
214420	
J01	MWDM 08S P01 MWDM 08P
214440	
J01	MWDM 08S P01 MWDM 08P
J02	MWDM 08S P02 MWDM 08P
214460	
J01	MWDM 08S P01 MWDM 08P
J02	MWDM 08S P02 MWDM 08P
214414	
J01	MWDM 08S P01 MWDM 08P
J02	MWDM 08S P02 MWDM 08P
J03	MWDM 08S P03 MWDM 08P
TEMPERATURE SENSOR	
J01	NANONIX P01 NANONIX
ACCELEROMETER	
J01	MICRODOT E1-18 P01 MICRODOT EP-18

Changes to Item 2547-121430-040-01-0C

1. Revision 01: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

2. Revision 02: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

3. Revision 03: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

4. Revision 04: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

5. Revision 05: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

6. Revision 06: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

7. Revision 07: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

8. Revision 08: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

9. Revision 09: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

10. Revision 10: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

11. Revision 11: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

12. Revision 12: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

13. Revision 13: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

14. Revision 14: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

15. Revision 15: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

16. Revision 16: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

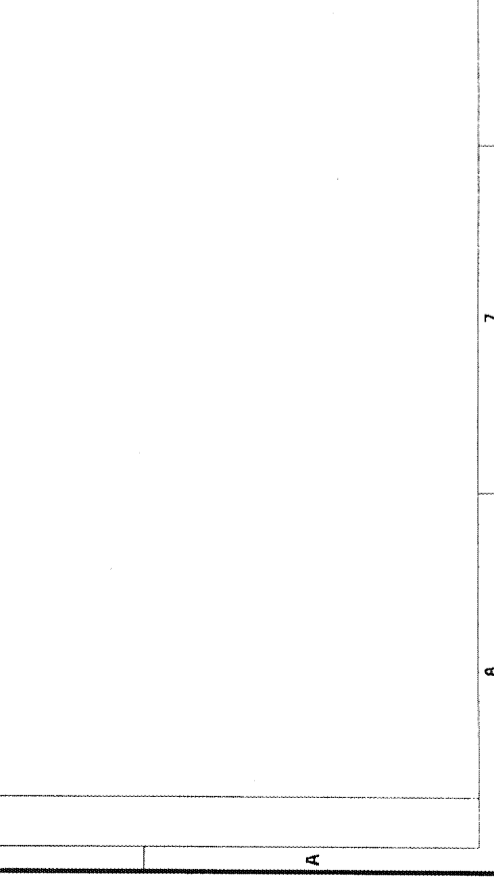
17. Revision 17: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

18. Revision 18: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

19. Revision 19: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

20. Revision 20: 01.03.2003. Changes to Item 2547-121430-040-01-0C, mod. 01.03.2003. 01.03.2003.

FREIGABE:		FESTIGKEIT:		VERTEILER:		DATUM:	
HP-2-ASED-ID-0088-01-0C							
FREIGABE AUSGABE:		ZUL. ABW.:		MASSTAB:		GEW.:	
		OBERFL.:		VERKSTOFF:			
CM:							
Beord. 27.06.03 R. Kammer		DATUM NAME		CCH Upper Ring CW (PFM)		Cryo Harness Interconnection Diagram	
gebr. 30.06.03 J. Lang		R. Kammer					
NORM PS		J. Lang					
A 27.06.03 J. Lang		W. Hund					
B 21.05.03 W. Hund							
AUSG. NR.		DATUM		NAME		URSPPR.	
		2547-121430-040-01-0C		astrium		ERS. F.:	
						ERS. D.:	



HERSCHEL Cryo-Harness Tables CCH(ext)

Cable_n		Designation		Cable										Harness SVM-CB to C/W I/F-CB		Harness SVM-CB to end item conn.		Harness SVM-CB to CCU-A / B			Total Harness WEU's to CW-CB and end items				
Component Name	Location	Harness Bundle	no_of_wires	no_of_shds	l-mA not applicable	DutyCycle not applicable	no_of_cables	cable_type	condu.	R_core Ohm/m at 300 K	CU mm²	SST mm²	Brass mm²	Insulation mm²	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_core Ohm/m at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K	
17	H101	HTT	4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1837	2,57	1837	0,253		0,00	1837	2,57	1837	2,57	
136	V103	HTT	4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1837	2,57	1837	0,253		0,00	1837	2,57	1837	2,57	
154	VS103	HTT	2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1837	208,68	1837	0,253		0,00	1837	208,68	1837	208,68	
18	H102	HTT	4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1795	2,51	1795	0,253		0,00	1795	2,51	1795	2,51	
139	V106	HTT	4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1795	2,51	1795	0,253		0,00	1795	2,51	1795	2,51	
157	VS106	HTT	2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1795	203,91	1795	0,253		0,00	1795	203,91	1795	203,91	
29	P101	HTT	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
34	T103	HTT	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
	T113	HTT	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
	T114	HTT	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
101	T702	HOT	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
	T704	HOT	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
103	T801	Lower chain	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
104	T802	Lower chain	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
105	T803	Lower chain	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
106	T804	Lower chain	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
107	T805	Lower chain	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
108	T806	Lower chain	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1799	204,37	1799					1799	204,37	1799	204,37
1	A101	HTT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
2	A102	HTT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
3	A103	HTT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
4	A104	HTT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
5	A105	HTT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
6	A106	HTT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
7	A107	HTT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
8	A108	HTT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
9	A109	HTT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
	A701	HOT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
	A702	HOT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
	A703	HOT	2	1			1	H02138	SST	113,6	0,0	0,088	0	0,771	2089	237,31	2089					2089	237,31	2089	237,31
138	V105	HTT	4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1710	2,39	1710					1710	2,39	1710	2,39
147	VH105	HTT	4	0			2	H02038	BRASS	9,5	0,0	0	0,032	0,448	1710	16,25	1710					1710	16,25	1710	16,25
156	VS105	HTT	2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1710	194,26	1710					1710	194,26	1710	194,26
151	VT105	HTT	4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1710	194,26	1710					1710	194,26	1710	194,26
144	V701	HOT	4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1710	2,39	1710					1710	2,39	1710	2,39
148	VH701	HOT	4	0			2	H02038	BRASS	9,5	0,0	0	0,032	0,448	1710	16,25	1710					1710	16,25	1710	16,25
162	VS701	HOT	2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1710	194,26	1710					1710	194,26	1710	194,26

HERSCHEL Cryo-Harness Tables CCH(ext)

Cable_n	Designation			no_of_wires	no_of_shd's	I-mA not applicable	DutyCycle not applicable	Cable								Harness SVM-CB to CVW I/F-CB			Harness SVM-CB to end item conn.		Harness SVM-CB to CCU-A / B			Total Harness WEU's to CVV-CB and end items	
	Component Name	Location	Harness Bundle					no_of_cables	cable_type	condu.	R_core Ohm/m at 300 K	CU mm ²	SST mm ²	Brass mm ²	Insulation mm ²	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_core Ohm/m at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K
152	VT701	HOT		4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1710	194,26						1710	194,26	
19	H103	HTT		4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1710	2,39						1710	2,39	
	HS103	HTT		2	0			0	H02038	BRASS	9,5	0,0	0	0,016	0,224	1710	16,25						1710	16,25	
23	H701	HOT		4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1710	2,39						1710	2,39	
	HS701	HTT		2	0			0	H02038	BRASS	9,5	0,0	0	0,016	0,224	1710	16,25						1710	16,25	
26	L102	HTT		2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1710	194,26						1710	194,26	
26	L102	HTT		2	0			1	H02038	BRASS	9,5	0,0	0	0,016	0,224	1710	16,25						1710	16,25	
27	L701	HOT		2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1710	194,26						1710	194,26	
27	L701	HOT		2	0			1	H02038	BRASS	9,5	0,0	0	0,016	0,224	1710	16,25						1710	16,25	
135	V102	HTT		4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1710	2,39						1710	2,39	
145	VH102	HTT		4	0			2	H02038	BRASS	9,5	0,0	0	0,032	0,448	1710	16,25						1710	16,25	
	VH103	HTT		4	0			2	H02038	BRASS	9,5	0,0	0	0,032	0,448	1710	16,25						1710	16,25	
153	VS102	HTT		2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1710	194,26						1710	194,26	
149	VT102	HTT		4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1710	194,26						1710	194,26	
	VT103	HTT		4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1710	194,26						1710	194,26	
144	V702	HOT		4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1914	2,68						1914	2,68	
	VH106	HTT		4	0			2	H02038	BRASS	9,5	0,0	0	0,032	0,448	1914	18,18						1914	18,18	
	VH702	HOT		4	0			2	H02038	BRASS	9,5	0,0	0	0,032	0,448	1914	18,18						1914	18,18	
	VS702	HOT		2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1914	217,43						1914	217,43	
	VT106	HTT		4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1914	217,43						1914	217,43	
	VT702	HOT		4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1914	217,43						1914	217,43	
20	H104	HTT		4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1914	2,68						1914	2,68	
24	H702	HOT		4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1914	2,68						1914	2,68	
25	L101	HTT		2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1914	217,43						1914	217,43	
25	L101	HTT		2	0			1	H02038	BRASS	9,5	0,0	0	0,016	0,224	1914	18,18						1914	18,18	
28	L702	HOT		2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1914	217,43						1914	217,43	
28	L702	HOT		2	0			1	H02038	BRASS	9,5	0,0	0	0,016	0,224	1914	18,18						1914	18,18	
137	V104	HTT		4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716	1914	2,68						1914	2,68	
146	VH104	HTT		4	0			2	H02038	BRASS	9,5	0,0	0	0,032	0,448	1914	18,18						1914	18,18	
155	VS104	HTT		2	0			1	H02038	SST	113,6	0,0	0,016	0	0,148	1914	217,43						1914	217,43	
150	VT104	HTT		4	0			2	H02038	SST	113,6	0,0	0,032	0	0,296	1914	217,43						1914	217,43	
	SPARE			20	0			10	H02038	SST	113,6	0,0	0,16	0	1,48	tbid	#WERT!						#WERT!	#WERT!	
	SPARE			2	0			1	H02038	BRASS	9,5	0,0	0	0,016	0,224	tbid	#WERT!						#WERT!	#WERT!	
	SPARE			2	0			1	H02030	BRASS	1,4	0,0	0	0,016	0,148	tbid	#WERT!						#WERT!	#WERT!	
22	H502	GHe S/S external Ventline		4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716								#WERT!	#WERT!	
	H503	GHe S/S external Ventline		4	0			2	H02030	BRASS	1,4	0,0	0	0,204	0,716								#WERT!	#WERT!	

Cable_n	Designation				no_of_cables	cable_type	condu.	Cable				Harness SVM-CB to CWV I/F-CB		Harness SVM-CB to end item conn.		Harness SVM-CB to CCU-A / B			Total Harness WEU's to CWV-CB and end items			
	Component Name	Location	Harness Bundle	no_of_wires				no_of_shd's	I-mA not applicable	DutyCycle not applicable	R_core Ohm/m at 300 K	CU mm ²	SST mm ²	Brass mm ²	Insulation mm ²	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_core Ohm/m at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)
	SI603	CryoCover Stat. Ind.	CCH-ICS35	2	0			113,6	0,0	0,016	0	0,148	tbd	#WERT!					#WERT!	#WERT!	Harness lth (mm)	R_max (Ohm) at 300 K
	SI604	CryoCover Stat. Ind.		2	0			113,6	0,0	0,016	0	0,148	tbd	#WERT!					#WERT!	#WERT!	Harness lth (mm)	R_max (Ohm) at 300 K
	T601	CryoCover Inside		4	0			113,6	0,0	0,032	0	0,296	tbd	#WERT!					#WERT!	#WERT!	Harness lth (mm)	R_max (Ohm) at 300 K
	T602	CryoCover Inside		4	0			113,6	0,0	0,032	0	0,296	tbd	#WERT!					#WERT!	#WERT!	Harness lth (mm)	R_max (Ohm) at 300 K

HERSCHEL Cryo-Harness Tables CCH (int)

Cable_n	Designation			no_of_wires	no_of_shd's	i-mA not applicable	DutyCycle not applicable	Cable										Harness CVW-CB to SFW-CB		Harness SFW-CB to end item conn.		Total Harness CWV-CB(int.) to end item conn.	
	Component Name	Location	Harness Bundle					R_core Ohm/m at 300 K	R_cable Ohm/m at 300 K	CU mm ²	SST mm ²	Brass mm ²	Insulation mm ²	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	
T202	OB			4	0									0.296	2496	283.55	1551	176.19	4047	459.74			
T212	OB			4	0									0.296	1748	198.57	1365	155.06	3113	353.64			
T221	OB			4	0									0.296	2362	268.32	1677	190.51	4039	458.83			
T223	OB			4	0									0.296	2362	268.32	2182	247.88	4544	516.20			
T227	OB			4	0									0.296	2362	268.32	2696	306.27	5058	574.59			
T228	OB			4	0									0.296	2362	268.32	1695	192.55	4057	460.88			
T232	OB			4	0									0.296	2496	283.55	1691	192.10	4187	475.64			
T234	OB			4	0									0.296	1127	128.03	1911	217.09	3038	345.12			
T236	OB			4	0									0.296	1127	128.03	1732	196.76	2859	324.78			
T242	SPiRE FPU			4	0									0.296	2496	283.55	1640	186.30	4136	469.85			
T244	SPiRE FPU			4	0									0.296	1632	185.40	1957	222.32	3589	407.71			
T246	SPiRE FPU			4	0									0.296	1632	185.40	827	93.95	2459	279.34			
T250	SPiRE FPU			4	0									0.296	1127	128.03	993	112.80	2120	240.83			
T254	SPiRE FPU			4	0									0.296	1127	128.03	1356	154.04	2463	282.07			
T258	SPiRE FPU			4	0									0.296	1632	185.40	1427	162.11	3059	347.50			
T423	1st Shield (innermost)			4	0									0.296	829	94.17	1956	222.20	2785	316.38			
T464	3rd Shield			4	0									0.296	550	2166.00	0.00	550	2166.00				
T862	Upper spatial framework			4	0									0.296			2561	290.93	2561	290.93			
T237	OB			4	0									0.296	1640	186.30	2024	229.93	3664	416.23			
T252	SPiRE FPU			4	0									0.296	1640	186.30	1317	149.61	2957	335.92			
T444	2nd Shield			4	0									0.296	669	76.00	2102	238.79	2771	314.79			
T213	OB			4	0									0.296	1801	204.59	1624	184.49	3425	389.08			
T235	OB			4	0									0.296	1230	139.73	1423	161.65	2653	301.38			
T247	SPiRE FPU			4	0									0.296	1230	139.73	1120	127.23	2350	266.96			
T248	SPiRE FPU			4	0									0.296	1230	139.73	1676	190.39	2906	330.12			
T256	SPiRE FPU			4	0									0.296	1230	139.73	1315	149.38	2545	289.11			
T208	OB			4	0									0.296	2514	285.59	1248	141.77	3762	427.36			
T222	OB			4	0									0.296	1596	181.31	2700	306.72	4296	488.03			
T224	OB			4	0									0.296	1596	181.31	2418	274.68	4014	455.99			
T225	OB			4	0									0.296	1596	181.31	1639	186.19	3235	367.50			
T226	OB			4	0									0.296	1596	181.31	1483	168.47	3079	349.77			
T231	OB			4	0									0.296	2514	285.59	1783	202.55	4297	488.14			
T233	OB			4	0									0.296	1230	139.73	2732	310.36	3962	450.08			
T207	OB			4	0									0.296	2556	290.36	1314	149.27	3870	439.63			
T211	OB			4	0									0.296	1895	215.27	2399	272.53	4294	487.80			
T249	SPiRE FPU			4	0									0.296	1361	154.61	1082	120.64	2423	275.25			
T251	SPiRE FPU			4	0									0.296	1361	154.61	1969	223.68	3330	378.29			
T253	SPiRE FPU			4	0									0.296	1361	154.61	1461	165.97	2822	320.58			
T255	SPiRE FPU			4	0									0.296	1361	154.61	1444	164.04	2805	318.65			
T423	1st Shield (innermost)			4	0									0.296	828	94.06	1144	129.96	1972	224.02			
T443	2nd Shield			4	0									0.296	724	82.25	970	110.19	1694	192.44			
T851	Upper chain			4	0									0.296			538	61.12	538	61.12			
T852	Upper chain			4	0									0.296			625	71.00	625	71.00			
T853	Upper chain			4	0									0.296			679	77.13	679	77.13			
T861	Upper spatial framework			4	0									0.296			2643	300.24	2643	300.24			

HERSCHEL Cryo-Harness Tables CCH (int)

Cable_n	Designation					no_of_cables	Cable							Harness CW-CB to SFW-CB		Harness SFW-CB to end item conn.		Total Harness CW-CB (int.) to end item conn.	
	Component Name	Location	Harness Bundle	no_of_wires	no_of_shds		DutyCycle not applicable	Insulation mm ²	Brass mm ²	SST mm ²	CU mm ²	R _{core} Ohm/m at 300 K	R _{cable} Ohm/m at 300 K	Harness lth (mm)	R _{max} (Ohm) at 300 K	Harness lth (mm)	R _{max} (Ohm) at 300 K	Harness lth (mm)	R _{max} (Ohm) at 300 K
87	T463	3rd Shield		4	0		0.032	0	0.296	113.6	454.4	770	87.47	1368	155.40	2138	242.88		
10	A201	OB	CCH-CCE20	2	1		0.088	0	0.771	113.6	227.2	1487	168.92	790	89.74	2277	258.67		
11	A202	OB		2	1		0.088	0	0.771	113.6	227.2	1487	168.92	690	78.38	2177	247.31		
12	A203	OB		2	1		0.088	0	0.771	113.6	227.2	1487	168.92	802	91.11	2289	260.03		
13	A204	OB		2	1		0.088	0	0.771	113.6	227.2	1739	197.55	1148	130.41	2887	327.96		
14	A205	OB		2	1		0.088	0	0.771	113.6	227.2	1739	197.55	1150	130.64	2889	328.19		
14	A206	OB		2	1		0.088	0	0.771	113.6	227.2	1739	197.55	1349	153.25	3088	350.80		
15	A421	1st Shield (innermost)		2	1		0.088	0	0.771	113.6	227.2	987	112.12	1386	157.45	2373	269.57		
16	A422	1st Shield (innermost)		2	1		0.088	0	0.771	113.6	227.2	987	112.12	1401	159.15	2388	271.28		
	P701	HOT		4	0		0.032	0	0.296	113.6	454.4			2123	241.17	2123	241.17		
35	T102	HTT	CCH-CCA11	4	0		0.032	0	0.296	113.6	454.4	1392	158.13	1119	127.12	2511	285.25		
36	T105	HTT		4	0		0.064	0	0.344	113.6	454.4	1353	153.70	2398	272.41	3751	426.11		
	HS 101	HTT		2	0		0	0.016	0.224	9.5	19.0	1545	12.85	2398	22.78	3751	35.63		
37	T106	HTT		4	0		0.032	0	0.296	113.6	454.4	1392	158.13	1119	127.12	2511	285.25		
39	T111	HTT		4	0		0.032	0	0.296	113.6	454.4	1353	153.70	2398	272.41	3751	426.11		
	T421	1st Shield (innermost)			4	0		0.032	0	0.296	113.6	454.4	893	101.44	945	107.35	1838	208.80	
80	T442	2nd Shield		4	0		0.032	0	0.296	113.6	454.4	783	88.95	982	111.56	1765	200.50		
85	T461	3rd Shield		4	0		0.032	0	0.296	113.6	454.4	760	86.34	1135	128.94	1895	215.27		
32	T101	HTT	CCH-CB11	4	0		0.032	0	0.296	113.6	454.4	1503	170.74	2398	272.41	3901	272.583.54		
35	T104	HTT		4	0		0.032	0	0.296	113.6	454.4	1545	175.51	1039	118.03	2584	293.54		
	HS 102	HTT		2	0		0	0.016	0.224	9.5	19.0	1545	14.68	1039	9.87	2584	24.55		
38	T107	HTT		4	0		0.032	0	0.296	113.6	454.4	1545	175.51	2628	298.54	4173	474.05		
74	T422	1st Shield (innermost)			4	0		0.032	0	0.296	113.6	454.4	966	109.74	1027	116.67	1993	226.40	
79	T441	2nd Shield			4	0		0.032	0	0.296	113.6	454.4	932	105.88	1055	119.85	1987	225.72	
86	T462	3rd Shield		4	0		0.032	0	0.296	113.6	454.4	871	98.95	951	108.03	1822	206.98		
100	T701	HOT		4	0		0.032	0	0.296	113.6	454.4	1601	181.87	1178	133.82	2779	315.69		
102	T703	HOT		4	0		0.032	0	0.296	113.6	454.4	1601	181.87	1335	151.66	2936	333.53		
40	T112	HTT		4	0		0.032	0	0.296	113.6	454.4	1503	170.74	3371	382.95	4874	553.69		
17	H101	HTT	CCH-CCA12	4	0		0	0.204	0.716	1.4	5.6	2241	3.14	1143	1.60	3384	4.74		
136	V103	HTT		4	0		0	0.204	0.716	1.4	5.6	2417	3.38	2815	3.94	5232	7.32		
154	V5103	HTT		2	0		0.016	0	0.148	113.6	227.2	2417	274.57	2815	319.78	5232	594.36		
18	H102	HTT	CCH-CB12	4	0		0	0.204	0.716	1.4	5.6	1290	1.81	1718	2.41	3008	4.21		
139	V106	HTT		4	0		0	0.204	0.716	1.4	5.6	2271	3.18	2347	3.29	4618	6.47		
157	V5106	HTT		2	0		0.016	0	0.148	113.6	227.2	2271	257.99	2347	266.62	4618	524.60		
29	P101	HTT	CCH-CCE11	4	0		0.032	0	0.296	113.6	454.4	1429	162.33	2895	328.87	4324	491.21		
34	T103	HTT		4	0		0.032	0	0.296	113.6	454.4	1429	162.33	1062	120.64	2491	282.98		
	T113	HTT		4	0		0.032	0	0.296	113.6	454.4	1429	162.33	3849	437.25	5278	599.58		
	T114	HTT		4	0		0.032	0	0.296	113.6	454.4	1429	162.33	3211	364.77	4640	527.10		
101	T702	HOT		4	0		0.032	0	0.296	113.6	454.4	1564	177.67	1094	124.28	2658	301.95		
103	T801	Lower chain		4	0		0.032	0	0.296	113.6	454.4	1564	177.67	1169	132.80	2733	310.47		
104	T802	Lower chain	4	0		0.032	0	0.296	113.6	454.4			2380	270.37	2380	270.37			
105	T803	Lower chain	4	0		0.032	0	0.296	113.6	454.4			2355	267.53	2355	267.53			
				4	0		0.032	0	0.296	113.6	454.4			2335	265.26	2335	265.26		

HERSCHEL Cryo-Harness Tables CCH (int)

Cable_n	Designation		no_of_wires		no_of_cables	Cable							Harness CVW-CB to SFW-CB		Harness SFW-CB to end item conn.		Total Harness CWV-CB(int.) to end item conn.		
	Component Name	Location	Harness Bundle	no_of_shds		DutyCycle not applicable	I-mA not applicable	condu.	R_core Ohm/m at 300 K	R_cable Ohm/m at 300 K	CU mm ²	SST mm ²	Brass mm ²	Insulation mm ²	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)
106	T804	Lower chain		4	0		SST	113.6	454.4	0.032	0	0.296				2431	276.16	2431	276.16
107	T805	Lower chain		4	0		SST	113.6	454.4	0.032	0	0.296				2406	273.32	2406	273.32
108	T806	Lower chain		4	0		SST	113.6	454.4	0.032	0	0.296				2383	270.71	2383	270.71
1	A101	HTT		2	1		SST	113.6	227.2	0.088	0	0.771	1416	160.86	281.27	3892	442.13	3892	442.13
2	A102	HTT		2	1		SST	113.6	227.2	0.088	0	0.771	1416	160.86	291.72	3984	452.58	3984	452.58
3	A103	HTT		2	1		SST	113.6	227.2	0.088	0	0.771	1416	160.86	294.79	4011	455.65	4011	455.65
4	A104	HTT		2	1		SST	113.6	227.2	0.088	0	0.771	1483	168.47	232.31	3528	400.78	3528	400.78
5	A105	HTT		2	1		SST	113.6	227.2	0.088	0	0.771	1483	168.47	232.65	3531	401.12	3531	401.12
6	A106	HTT		2	1		SST	113.6	227.2	0.088	0	0.771	1483	168.47	240.60	3601	409.07	3601	409.07
7	A107	HTT		2	1		SST	113.6	227.2	0.088	0	0.771	1416	160.86	357.73	4565	518.58	4565	518.58
8	A108	HTT		2	1		SST	113.6	227.2	0.088	0	0.771	1483	168.47	107.69	2431	276.16	2431	276.16
9	A109	HTT		2	1		SST	113.6	227.2	0.088	0	0.771	1416	160.86	189.03	3080	349.89	3080	349.89
A701	HOT			2	1		SST	113.6	227.2	0.088	0	0.771	1565	177.78	87.70	2337	265.48	2337	265.48
A702	HOT			2	1		SST	113.6	227.2	0.088	0	0.771	1565	177.78	87.81	2338	265.60	2338	265.60
A703	HOT			2	1		SST	113.6	227.2	0.088	0	0.771	1565	177.78	81.00	2278	258.78	2278	258.78
138	V105	HTT		4	0		BRASS	1.4	5.6	0	0.204	0.716			2241	3.14	2241	3.14	
147	VH105	HTT		4	0		BRASS	9.5	38.0	0	0.032	0.448			2241	21.29	2241	21.29	
156	VS105	HTT		2	0		SST	113.6	227.2	0.016	0	0.148			2241	254.58	2241	254.58	
151	VT105	HTT		4	0		SST	113.6	454.4	0.032	0	0.296			2241	254.58	2241	254.58	
144	V701	HOT		4	0		BRASS	1.4	5.6	0	0.204	0.716			1819	2.55	1819	2.55	
148	VH701	HOT		4	0		BRASS	9.5	38.0	0	0.032	0.448			1819	17.28	1819	17.28	
162	VS701	HOT		2	0		SST	113.6	227.2	0.016	0	0.148			1819	206.64	1819	206.64	
152	VT701	HOT		4	0		SST	113.6	454.4	0.032	0	0.296			1819	206.64	1819	206.64	
19	H103	HTT		4	0		BRASS	1.4	5.6	0	0.204	0.716	1314	1.84	1070	1.50	2384	3.34	
HS103	HTT			2	0		BRASS	9.5	19.0	0	0.016	0.224	1314	12.48	1070	10.17	2384	22.65	
23	H701	HOT		4	0		BRASS	1.4	5.6	0	0.204	0.716	1391	1.95	1076	1.51	2467	3.45	
HS701	HTT			2	0		BRASS	9.5	19.0	0	0.016	0.224	1391	13.21	1076	10.22	2467	23.44	
26	L102	HTT		2	0		SST	113.6	227.2	0.016	0	0.086	1484	168.58	2397	272.30	3881	440.88	
26	L102	HTT		2	0		BRASS	9.5	19.0	0	0.016	0.224	1484	14.10	2397	22.77	3881	36.87	
27	L701	HOT		2	0		SST	113.6	227.2	0.016	0	0.086	1391	158.02	1008	114.51	2399	272.53	
27	L701	HOT		2	0		BRASS	9.5	19.0	0	0.016	0.224	1391	13.21	1008	9.58	2399	22.79	
135	V102	HTT		4	0		BRASS	1.4	5.6	0	0.204	0.716	1484	2.08	2443	3.42	3927	5.50	
145	VH102	HTT		4	0		BRASS	9.5	38.0	0	0.032	0.448	1484	14.10	2443	23.21	3927	37.31	
VH103	HTT			4	0		BRASS	9.5	38.0	0	0.032	0.448	1503	14.28	2781	26.42	4284	40.70	
153	VS102	HTT		2	0		SST	113.6	227.2	0.016	0	0.148	1484	168.58	2443	277.52	3927	446.11	
149	VT102	HTT		4	0		SST	113.6	454.4	0.032	0	0.296	1484	168.58	2443	277.52	3927	446.11	
VT103	HTT			4	0		SST	113.6	454.4	0.032	0	0.296	1503	170.74	2781	315.92	4284	486.66	
144	V702	HOT		4	0		BRASS	1.4	5.6	0	0.204	0.716			1470	2.06	1470	2.06	
VH106	HTT			4	0		BRASS	9.5	38.0	0	0.032	0.448	1506	14.31	2297	21.82	3803	36.13	
VH702	HOT			4	0		BRASS	9.5	38.0	0	0.032	0.448			1470	13.97	1470	13.97	
VS702	HOT			2	0		SST	113.6	227.2	0.016	0	0.148			1470	166.99	1470	166.99	
VT106	HTT			4	0		SST	113.6	454.4	0.032	0	0.296	1506	171.08	2297	260.94	3803	432.02	
VT702	HOT			4	0		SST	113.6	454.4	0.032	0	0.296			1470	166.99	1470	166.99	
H104	HTT			4	0		BRASS	1.4	5.6	0	0.204	0.716	1626	2.28	1848	2.59	3474	4.86	
H702	HOT			4	0		BRASS	1.4	5.6	0	0.204	0.716	1527	2.14	1108	1.55	2635	3.69	
L101	HTT			2	0		SST	113.6	227.2	0.016	0	0.086	1626	184.71	2911	330.69	4537	515.40	
L101	HTT			2	0		BRASS	9.5	19.0	0	0.016	0.224	1626	15.45	2911	27.65	4537	43.10	
L702	HOT			2	0		SST	113.6	227.2	0.016	0	0.086	1527	173.47	1694	192.44	3221	365.91	
L702	HOT			2	0		BRASS	9.5	19.0	0	0.016	0.224	1527	14.51	1694	16.09	3221	30.60	

HERSCHEL Cryo-Harness Tables CCH (int)

Cable_n	Designation					no_of_cables	cable_type	condu.	R_core Ohm/m at 300 K	R_cable Ohm/m at 300 K	CU mm²	SST mm²	Brass mm²	Insulation mm²	Harness CVV-CB to SFW-CB		Harness SFW-CB to end item conn.		Total Harness CVV-CB(int.) to end item conn.	
	Component Name	Location	Harness Bundle	no_of_wires	no_of_shd's										I-mA not applicable	DutyCycle not applicable	Harness lth (mm)	R_max (Ohm) at 300 K	Harness lth (mm)	R_max (Ohm) at 300 K
137	V104	HTT		4	0			BRASS	1.4	5.6		0	0.204	0.716	1677	2.35	3232	4.52	4909	6.87
146	VH104	HTT		4	0			BRASS	9.5	38.0		0	0.032	0.448	1677	15.93	3232	30.70	4909	46.64
155	VS104	HTT		2	0			SST	113.6	227.2		0.016	0	0.148	1677	190.51	3232	367.16	4909	557.66
150	VT104	HTT		4	0			SST	113.6	454.4		0.032	0	0.296	1677	190.51	3232	367.16	4909	557.66
	SPARE			20	0			SST	113.6	2272.0		0.16	0	0.86	1800	204.48			1800	204.48
	SPARE			2	0			BRASS	9.5	19.0		0	0.016	0.224	1800	17.10			1800	17.10
	SPARE			2	0			BRASS	1.4	2.8		0	0.016	0.086	1800	2.52			1800	2.52

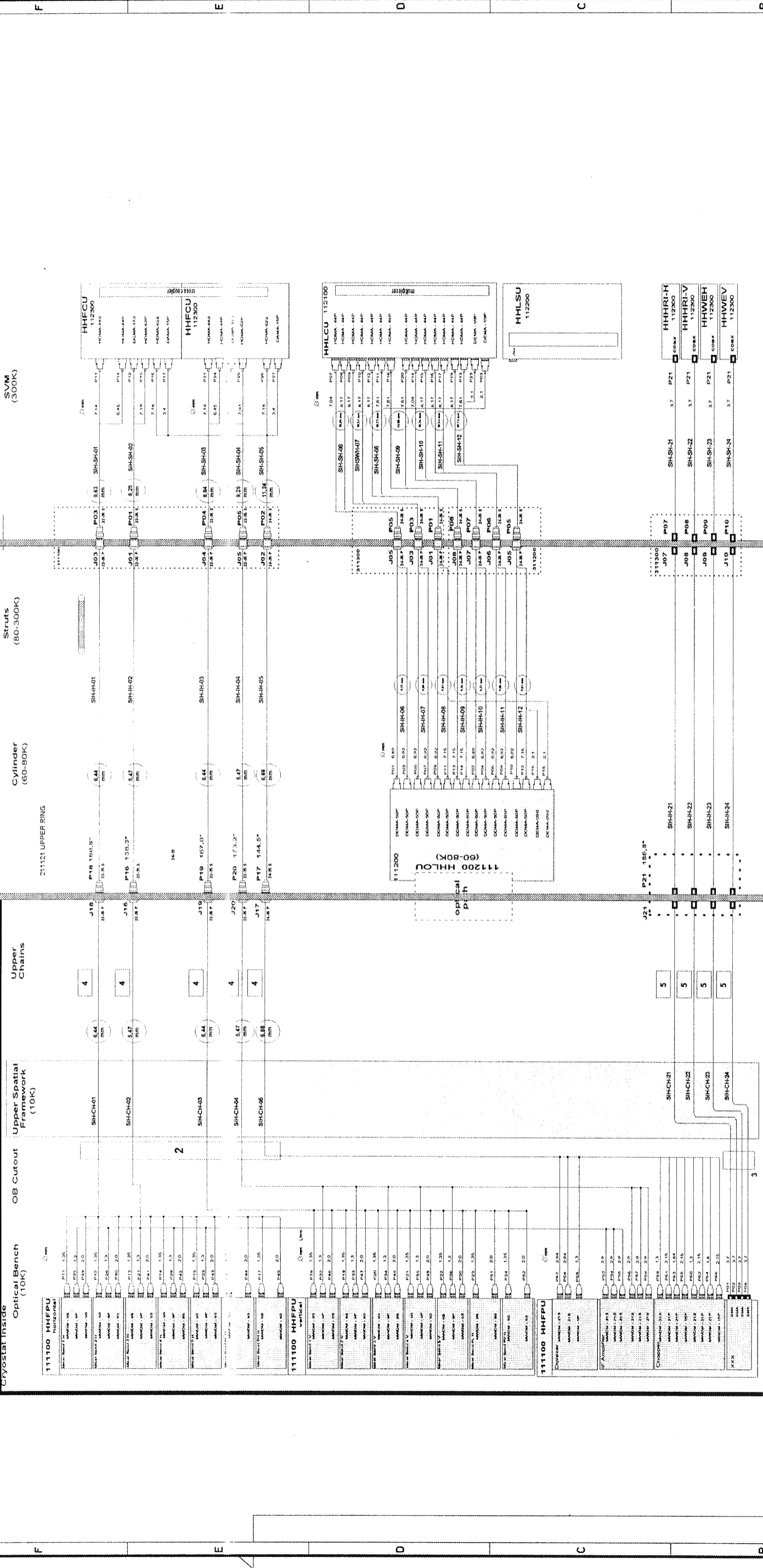
HERSCHEL

Cryostat Outside

SVM I/F -CB
3110000

CVV I/F -CB
211121

Cryostat Inside



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FREIGABE:	FESTIGKEIT:	VERTEILER:	DATUM:
HP-2-ASED-ID-0090-01-0B			
FREIGABE AUSGABE:			
CM:			
ZUL. ABW.:	OBERFL.:	MASSTAB:	WERKSTOFF:
DATUM		NAME	
Bearb.	21.05.03	W. Hund	
96Dr.			
NORM			
PS			
HIFI (PFM)			
Cryo Harness Interconnection Diagram			
ASTRUM		2547-121430-010-01-0B	
URSPPR.:		ERS. D.:	
AUSG. NR.		DATUM	
B	18.09.03	W. Hund	
A	21.05.03	W. Hund	

Cable_n	Designation	Unit / Connector	no_of_wires	no_of_shd's	Bundle_No_SIH-IH-xx	U-Profile-No.	Strut-No.	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (T %)	Cable								CVW ext. Harness SVM-CB to CVV I/F-CB			SVM Harness SVM-CB to 's			Harness total (cvw int. & ext.)		
											no_of_cables	cabl_type	condu.	Manganin mm²	SiO2mm²	SST mm²	Brass mm²	Insulation mm²	R_core Ohm/m at 300 K	Harness lth (m)	R_max (Ohm) at 300 K	R_core (Ohm)	Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K	delta R (Ohm)
1	Mixer 1-VM-H /IM-H	FHFPUP11	3	1				1000	1.0E-06	0.048					1.004	113.6	275.93	0.253	2.899	0.733	7.153	483.99	516.01	1.6E-08			
1	Mixer 1-B-H	FHFPUP11	2	1				1000	2.5E-04	0.048					0.086	113.6	275.93	0.253	2.899	0.733	7.153	483.99	516.01	6.8E-04			
2	Mixer 2-VM-H /IM-H	FHFPUP12	3	1				1000	1.0E-06	0.048					1.004	113.6	275.93	0.253	2.899	0.733	7.203	489.67	510.33	1.6E-08			
2	Mixer 2-B-H	FHFPUP12	2	1				1000	2.5E-04	0.048					0.086	113.6	275.93	0.253	2.899	0.733	7.203	489.67	510.33	6.8E-04			
3	Mixer 3-VM-H /IM-H	FHFPUP13	3	1				1000	1.0E-06	0.048					1.004	113.6	275.93	0.253	2.899	0.733	7.253	495.35	504.65	1.6E-08			
3	Mixer 3-B-H	FHFPUP13	2	1				1000	2.5E-04	0.048					0.086	113.6	275.93	0.253	2.899	0.733	7.253	495.35	504.65	6.8E-04			
4	Mixer 4-VM-H /IM-H	FHFPUP14	3	1				1000	1.0E-06	0.048					1.004	113.6	275.93	0.253	2.899	0.733	7.303	501.03	498.97	1.6E-08			
4	Mixer 4-B-H	FHFPUP14	2	1				1000	2.5E-04	0.048					0.086	113.6	275.93	0.253	2.899	0.733	7.303	501.03	498.97	6.8E-04			
5	Mixer 5-VM-H /IM-H	FHFPUP15	3	1				1000	1.0E-06	0.048					1.004	113.6	275.93	0.253	2.899	0.733	7.354	506.82	493.18	1.6E-08			
5	Mixer 5-B-H	FHFPUP15	2	1				1000	2.5E-04	0.048					0.086	113.6	275.93	0.253	2.899	0.733	7.354	506.82	493.18	6.8E-04			
6	Mixer 6-VM-H /IM-H	FHFPUP16	3	1				1000	1.0E-06	0.048					1.004	113.6	275.93	0.253	2.899	0.733	7.404	512.50	487.50	1.6E-08			
6	Mixer 6-B-H	FHFPUP16	2	1				1000	2.5E-04	0.048					0.086	113.6	275.93	0.253	2.899	0.733	7.404	512.50	487.50	6.8E-04			
7	Mixer 7-VM-H /IM-H	FHFPUP17	3	1				1000	1.0E-06	0.048					1.004	113.6	275.93	0.253	2.899	0.733	7.454	518.18	481.82	1.6E-08			
7	Mixer 7-B-H	FHFPUP17	2	1				1000	2.5E-04	0.048					0.086	113.6	275.93	0.253	2.899	0.733	7.454	518.18	481.82	6.8E-04			
15	FIF-G1-H /G2-H	FHFPUP39	3	1				1000	1.0E-06	0.333					0.856	113.6	275.93	0.253	2.899	0.733	7.181	487.17	512.83	1.1E-07			
15	FIF1-D1-H /D2-H	FHFPUP39	2	1				25	1.0E-02	0.050					0.124	1.511	3.40	0.253	2.899	0.733	7.181	6.73	18.27	1.4E-02			
15	FIF-TST1-H	FHFPUP39	1					25	1.0E-03	0.300					0.051	0.128	1.4	0.253	2.899	0.733	7.181	6.73	18.27	4.2E-04			
15	FIF-RTN-H	FHFPUP39	1					25	2.0E-02	0.050					0.051	0.128	1.4	0.253	2.899	0.733	7.181	6.73	18.27	2.8E-02			
15	FIF-G1-H /G2-H	FHFPUP40	3	1	01	3132		1000	1.0E-06	0.333					0.856	113.6	275.93	0.253	2.899	0.733	7.231	492.85	507.15	1.1E-07			
15	FIF2-D1-H /D2-H	FHFPUP40	2	1				1000	1.0E-06	0.333					0.856	113.6	275.93	0.253	2.899	0.733	7.231	492.85	507.15	1.1E-07			
15	FIF-RTN-H	FHFPUP40	1					25	2.0E-02	0.050					0.102	1.405	3.40	0.253	2.899	0.733	7.231	6.80	18.20	2.4E-02			
15	FIF-G1-H /G2-H	FHFPUP41	3	1				1000	1.0E-06	0.333					0.856	113.6	275.93	0.253	2.899	0.733	7.281	498.53	501.47	1.1E-07			
15	FIF3-D1-H /D2-H	FHFPUP41	2	1				25	1.0E-02	0.050					0.102	1.405	3.40	0.253	2.899	0.733	7.281	6.87	18.13	1.4E-02			
15	FIF-RTN-H	FHFPUP41	1					25	2.0E-02	0.050					0.051	0.128	1.4	0.253	2.899	0.733	7.281	6.87	18.13	2.8E-02			
15	FIF-G1-H /G2-H	FHFPUP42	3	1				1000	1.0E-06	0.300					0.856	113.6	275.93	0.253	2.899	0.733	7.331	504.21	495.79	1.0E-07			
15	FIF4-D1-H /D2-H	FHFPUP42	2	1				1000	1.0E-06	0.300					0.856	113.6	275.93	0.253	2.899	0.733	7.331	504.21	495.79	1.0E-07			
15	FIF-TST2-H	FHFPUP42	1					25	1.0E-03	0.333					0.124	1.511	3.40	0.253	2.899	0.733	7.331	6.94	18.06	1.4E-02			
15	FIF-RTN-H	FHFPUP42	1					25	2.0E-02	0.050					0.051	0.128	1.4	0.253	2.899	0.733	7.331	6.94	18.06	4.7E-04			
15	FIF-G1-H /G2-H	FHFPUP43	3	1				1000	1.0E-06	0.300					0.856	113.6	275.93	0.253	2.899	0.733	7.382	510.00	490.00	1.0E-07			
15	FIF5-D1-H /D2-H	FHFPUP43	2	1				25	1.0E-02	0.050					0.102	1.405	3.40	0.253	2.899	0.733	7.382	7.01	17.99	1.4E-02			
15	FIF-RTN-H	FHFPUP43	1					25	2.0E-02	0.050					0.051	0.128	1.4	0.253	2.899	0.733	7.382	7.01	17.99	2.8E-02			
15	FIF-G1-H /G2-H	FHFPUP44	3	1				1000	1.0E-06	0.333					0.856	113.6	275.93	0.253	2.899	0.733	7.432	515.68	484.32	1.1E-07			
15	FIF6-D1-H /D2-H	FHFPUP44	2	1				25	1.0E-02	0.050					0.102	1.405	3.40	0.253	2.899	0.733	7.432	7.08	17.92	1.4E-02			
15	FIF-RTN-H	FHFPUP44	1					25	2.0E-02	0.050					0.051	0.128	1.4	0.253	2.899	0.733	7.432	7.08	17.92	2.8E-02			
15	FIF-G1-H /G2-H	FHFPUP45	3	1				1000	1.0E-06	0.333					0.856	113.6	275.93	0.253	2.899	0.733	7.482	521.36	478.64	1.1E-07			
15	FIF7-D1-H /D2-H	FHFPUP45	2	1				25	1.0E-02	0.050					0.102	1.405	3.40	0.253	2.899	0.733	7.482	7.15	17.85	1.4E-02			
15	FIF-RTN-H	FHFPUP45	1					25	2.0E-02	0.050					0.051	0.128	1.4	0.253	2.899	0.733	7.482	7.15	17.85	2.8E-02			
	Sum Bundle 01		79	21										2.404	1.173	24.82									3.0E-01	8.99E-01	
8	MG1-H	FHFPUP25	2	1				100	1.5E-02	0.048					0.016	1.154	9	0.253	3.067	0.776	7.331	39.15	60.85	1.9E-01			
8	HT1-H	FHFPUP25	2	1				100	1.0E-02	0.000					0.016	0.086	9	0.253	3.067	0.776	7.331	39.15	60.85	8.6E-04			
9	MG2-H	FHFPUP26	2	1				100	1.5E-02	0.048					0.016	1.154	9	0.253	3.067	0.776	7.381	39.60	60.40	1.9E-01			
9	HT2-H	FHFPUP26	2	1				100	1.0E-02	0.000					0.016	0.086	9	0.253	3.067	0.776	7.381	39.60	60.40	8.6E-04			
10	MG3-H	FHFPUP27	2	1				100	1.5E-02	0.048					0.016	1.154	9	0.253	3.067	0.776	7.431	40.05	59.95	1.9E-01			
10	HT3-H	FHFPUP27	2	1				100	1.0E-02	0.000					0.016	0.086	9	0.253	3.067	0.776	7.431	40.05	59.95	8.6E-04			
11	MG4-H	FHFPUP28	2	1				100	1.5E-02	0.048					0.016	1.154	9	0.253	3.067	0.776	7.481	40.50	59.50	1.9E-01			
11	HT4-H	FHFPUP28	2	1				100	1.0E-02	0.000					0.016	0.086	9	0.253	3.067	0.776	7.481	40.50	59.50	8.6E-04			
12	MG5-H	FHFPUP29	2	1				100	1.5E-02	0.048					0.016	1.154	9	0.253	3.067	0.776	7.532	40.96	59.04	1.9E-01			
12	HT5-H	FHFPUP29	2	1				100	1.0E-02	0.000					0.016	0.086	9	0.253	3.067	0.776	7.532	40.96	59.04	8.6E-04			
22	SF1-1-3/D1-H	FHFPUP53	3	1				25	1.0E-02	0.048					0.134	0.153	1.946	1.4	0.253	3.067	0.776	8.463	8.33	16.67	2.0E-02		
22	SIF-RTN1-H	FHFPUP53	1					25	1.0E-02	0.333					0.051	0.128	1.4	0.253	3.067	0.776	8.463	8.33	16.67	4.7E-02			
22	SIF-TST1-H	FHFPUP53	1					25	1.0E-03	0.333					0.051	0.128	1.4	0.253	3.067	0.776	8.463	8.33	16.67	4.7E-04			
22	SF1-4-7/D1-H	FHFPUP53	4	1			29	25	1.0E-02	0.048					0.128	0.204	1.81	1.4	0.253	3.067	0.776	8.463	8.33	16.67	2.7E-02		
22	SIF-RTN1-H	FHFPUP53	1				29	25	2.0E-02	0.333					0.051	0.079	1.4	0.253	3.067	0.776	8.463	8.33	16.67	1.9E-01			
22	SIF-G1A-H /G1B-H	FHFPUP53	4	1			29	1000	1.0E-06	0.333					0.114	0.962	113.6	0.253	3.067	0.776	8.463	613.76	396.24	1.5E-07			

Cable_n	Designation	Unit / Connector	no_of_wires	no_of_shd's	Bundle_No._SIH-IH-xx	U-Profile-No.	Strut-No.	R_max_core (Ohm) at 300 K		L_nominal (A)	Duty_Cycle (T + t)	Cable									CVV ext. Harness SVM-CB to CVV I/F-CB		SVM Harness SVM-CB to 's			Harness total (cvv int. & ext.)			P el, avg [mW/m]	P el, On [mW/m]
								no_of_cables				cable_type	condu.	Manganin mm ²	SiO2mm ²	SST mm ²	Brass mm ²	Insulation mm ²	R_core Ohm/m at 300 K	Harness lth (m)	R_max (Ohm)	R_core (Ohm)	Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K	delta R (Ohm)			
23	SFI 1-3 / D2-H	FHPUP54	3	1				25	1.0E-02	0.048	1	H05130(3)	BRASS				0.134	0.153	1.946	1.4	2.394	3.35	0.253	3.067	0.776	8.482	8.36	16.64	2.0E-02	
23	SIF-RTN2-H	FHPUP54	1					25	1.0E-02	0.333		H05130(1)	BRASS						0.128	1.4	2.394	3.35	0.253	3.067	0.776	8.482	8.36	16.64	4.7E-02	
23	SIF-TS2-H	FHPUP54	1					25	1.0E-03	0.333		H05130(1)	BRASS						0.128	1.4	2.394	3.35	0.253	3.067	0.776	8.482	8.36	16.64	4.7E-04	
23	SFI 4-7 / D2-H	FHPUP54	4	1				25	1.0E-02	0.048	1	H05130(4)	BRASS				0.134	0.204	2.074	1.4	2.394	3.35	0.253	3.067	0.776	8.482	8.36	16.64	2.7E-02	
23	SIF-RTN2-H	FHPUP54	1					25	2.0E-02	0.333		H05130(1)	BRASS						0.128	1.4	2.394	3.35	0.253	3.067	0.776	8.482	8.36	16.64	1.9E-01	
23	SIF-G2A-H / G2B-H	FHPUP54	4	1				1000	1.0E-06	0.333	1	H04138	SST				0.114		0.962	113.6	2.394	271.96	0.253	3.067	0.776	8.482	615.92	384.08	1.5E-07	
24	SFI 1-3 / D3-H	FHPUP55	3	1				25	1.0E-02	0.048	1	H05130(3)	BRASS				0.134	0.153	1.946	1.4	2.394	3.35	0.253	3.067	0.776	8.525	8.42	16.58	2.0E-02	
24	SIF-RTN3-H	FHPUP55	1					25	1.0E-02	0.333		H05130(1)	BRASS						0.128	1.4	2.394	3.35	0.253	3.067	0.776	8.525	8.42	16.58	4.7E-02	
24	SIF-TS3-H	FHPUP55	1					25	1.0E-03	0.333		H05130(1)	BRASS						0.128	1.4	2.394	3.35	0.253	3.067	0.776	8.525	8.42	16.58	4.7E-04	
24	SFI 4-7 / D3-H	FHPUP55	4	1				25	1.0E-02	0.048	1	H05130(4)	BRASS				0.134	0.204	2.074	1.4	2.394	3.35	0.253	3.067	0.776	8.525	8.42	16.58	2.7E-02	
24	SIF-RTN3-H	FHPUP55	1					25	2.0E-02	0.333		H05130(1)	BRASS						0.128	1.4	2.394	3.35	0.253	3.067	0.776	8.525	8.42	16.58	1.9E-01	
24	SIF-G3A-H / G3B-H	FHPUP55	4	1				1000	1.0E-06	0.333	1	H04138	SST				0.114		0.962	113.6	2.394	271.96	0.253	3.067	0.776	8.525	620.80	379.20	1.5E-07	
	Sum Bundle 02																1.59	1.69	21.99										1.8E+00	5.43E+00
1	Mixer 1-VM-V / IM-V	FHPUP18	3	1				1000	1.0E-06	0.048	1	H05138(3)	SST				0.112		1.004	113.6	2.297	260.94	0.253	2.852	0.722	7.025	474.77	525.23	1.6E-08	
1	Mixer 1-B-V	FHPUP18	2					1000	2.5E-04	0.048		H05138(2)	SST				0.016		0.086	113.6	2.297	260.94	0.253	2.852	0.722	7.025	474.77	525.23	6.8E-04	
2	Mixer 2-VM-V / IM-V	FHPUP19	3	1				1000	1.0E-06	0.048	1	H05138(3)	SST				0.016		1.004	113.6	2.297	260.94	0.253	2.852	0.722	7.03	475.34	524.66	1.6E-08	
2	Mixer 2-B-V	FHPUP19	2					1000	2.5E-04	0.048		H05138(2)	SST				0.016		0.086	113.6	2.297	260.94	0.253	2.852	0.722	7.03	475.34	524.66	6.8E-04	
3	Mixer 3-VM-V / IM-V	FHPUP20	3	1				1000	1.0E-06	0.048	1	H05138(3)	SST				0.112		1.004	113.6	2.297	260.94	0.253	2.852	0.722	7.071	480.00	520.00	1.6E-08	
3	Mixer 3-B-V	FHPUP20	2					1000	2.5E-04	0.048		H05138(2)	SST				0.016		0.086	113.6	2.297	260.94	0.253	2.852	0.722	7.071	480.00	520.00	6.8E-04	
4	Mixer 4-VM-V / IM-V	FHPUP21	3	1				1000	1.0E-06	0.048	1	H05138(3)	SST				0.112		1.004	113.6	2.297	260.94	0.253	2.852	0.722	7.076	480.57	519.43	1.6E-08	
4	Mixer 4-B-V	FHPUP21	2					1000	2.5E-04	0.048		H05138(2)	SST				0.016		0.086	113.6	2.297	260.94	0.253	2.852	0.722	7.076	480.57	519.43	6.8E-04	
5	Mixer 5-VM-V / IM-V	FHPUP22	3	1				1000	1.0E-06	0.048	1	H05138(3)	SST				0.112		1.004	113.6	2.297	260.94	0.253	2.852	0.722	7.123	485.91	514.09	1.6E-08	
5	Mixer 5-B-V	FHPUP22	2					1000	2.5E-04	0.048		H05138(2)	SST				0.016		0.086	113.6	2.297	260.94	0.253	2.852	0.722	7.123	485.91	514.09	6.8E-04	
6	Mixer 6-VM-V / IM-V	FHPUP23	3	1				1000	1.0E-06	0.048	1	H05138(3)	SST				0.112		1.004	113.6	2.297	260.94	0.253	2.852	0.722	7.126	486.25	513.75	1.6E-08	
6	Mixer 6-B-V	FHPUP23	2					1000	2.5E-04	0.048		H05138(2)	SST				0.016		0.086	113.6	2.297	260.94	0.253	2.852	0.722	7.126	486.25	513.75	6.8E-04	
7	Mixer 7-VM-V / IM-V	FHPUP24	3	1				1000	1.0E-06	0.048	1	H05138(3)	SST				0.112		1.004	113.6	2.297	260.94	0.253	2.852	0.722	7.173	491.59	508.41	1.6E-08	
7	Mixer 7-B-V	FHPUP24	2					1000	2.5E-04	0.048		H05138(2)	SST				0.016		0.086	113.6	2.297	260.94	0.253	2.852	0.722	7.173	491.59	508.41	6.8E-04	
15	FIF-G1-V / G2-V	FHPUP46	3	1				1000	1.0E-06	0.300	1	H03138	SST				0.1		0.856	113.6	2.297	260.94	0.253	2.852	0.722	7.177	492.04	507.96	1.0E-07	
15	FIF-D1-V / D2-V	FHPUP46	2	1				25	1.0E-02	0.050	1	H04130(2)	BRASS				0.124	0.102	1.511	1.4	2.297	3.22	0.253	2.852	0.722	7.177	6.78	18.22	1.4E-02	
15	FIF-TS1-V	FHPUP46	1					25	1.0E-03	0.300		H04130(1)	BRASS						0.128	1.4	2.297	3.22	0.253	2.852	0.722	7.177	6.78	18.22	4.2E-04	
15	FIF-RTN-V	FHPUP46	1					25	2.0E-02	0.050		H04130(1)	BRASS						0.128	1.4	2.297	3.22	0.253	2.852	0.722	7.177	6.78	18.22	2.8E-02	
16	FIF-G1-V / G2-V	FHPUP47	3	1	03		32	1000	1.0E-06	0.300	1	H03138	SST				0.1		0.856	113.6	2.297	260.94	0.253	2.852	0.722	7.224	497.38	502.62	1.0E-07	
16	FIF-D1-V / D2-V	FHPUP47	2	1				25	1.0E-02	0.050	1	H03130(2)	BRASS				0.112	0.102	1.405	1.4	2.297	3.22	0.253	2.852	0.722	7.224	6.84	18.16	1.4E-02	
16	FIF-RTN-V	FHPUP47	1					25	2.0E-02	0.050		H03130(1)	BRASS						0.128	1.4	2.297	3.22	0.253	2.852	0.722	7.224	6.84	18.16	2.8E-02	
17	FIF-G1-V / G2-V	FHPUP48	3	1				1000	1.0E-06	0.333	1	H03138	SST				0.1		0.856	113.6	2.297	260.94	0.253	2.852	0.722	7.227	497.72	502.28	1.1E-07	
17	FIF-D1-V / D2-V	FHPUP48	2	1				25	1.0E-02	0.050	1	H03130(2)	BRASS				0.112	0.102	1.405	1.4	2.297	3.22	0.253	2.852	0.722	7.227	6.85	18.15	1.4E-02	
17	FIF-RTN-V	FHPUP48	1					25	2.0E-02	0.050		H03130(1)	BRASS						0.128	1.4	2.297	3.22	0.253	2.852	0.722	7.227	6.85	18.15	2.8E-02	
18	FIF-G1-V / G2-V	FHPUP49	3	1				1000	1.0E-06	0.333	1	H03138	SST				0.1		0.856	113.6	2.297	260.94	0.253	2.852	0.722	7.272	502.83	497.17	1.1E-07	
18	FIF-D1-V / D2-V	FHPUP49	2	1				25	1.0E-02	0.050	1	H04130(2)	BRASS				0.124	0.102	1.511	1.4	2.297	3.22	0.253	2.852	0.722	7.272	6.91	18.09	1.4E-02	
18	FIF-TS2-V	FHPUP49	1					25	1.0E-03	0.333		H04130(1)	BRASS						0.128	1.4	2.297	3.22	0.253	2.852	0.722	7.272	6.91	18.09	4.7E-04	
18	FIF-RTN-V	FHPUP49	1					25	2.0E-02	0.050		H04130(1)	BRASS						0.128	1.4	2.297	3.22	0.253	2.852	0.722	7.272	6.91	18.09	2.8E-02	
19	FIF-G1-V / G2-V	FHPUP50	3	1				1000	1.0E-06	0.333	1																			

Cable_n	Designation		no_of_wires	no_of_shd's	Bundle_No_SIH-xx	U-Profile-No.	Strut-No.	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (T + t)	Cable								CVV ext. Harness SVM-CB to CVV I/F-CB		SVM Harness SVM-CB to 's			Harness total (cvv int. & ext.)			P el, avg [mW/m]	P el, On [mW/m]				
	Description	Unit / Connector									no_of_cables	type	condu.	Manganin mm²	SI02mm²	SST mm²	Brass mm²	Insulation mm²	R_core Ohm/m at 300 K	Harness lth (m)	R_max (Ohm) at 300 K	R_core (Ohm)	Harness lth (m)	R_max (Ohm)	R_max (Ohm) at 300 K	R_max (Ohm) at 300 K			R_max (Ohm) at 300 K	Harness lth (m) total	R_max (Ohm) at 300 K	delta R (Ohm)
21	FI7-D1-V / D2-V	FHPUP52	2	1				25	1.0E-02	0.050	1	H03130(2)	BRASS	0.112	0.102	1.405	1.4	2.297	2.297	0.253	2.852	0.722	7.321	6.98	18.02	18.02	6.98	7.321	6.98	18.02	1.4E-02	
21	FIF-RTN-V	FHPUP52	1					25	2.0E-02	0.050		H03130(1)	BRASS		0.051	0.128	1.4	2.297		0.253	2.852	0.722	7.321	6.98	18.02	6.98	7.321	6.98	18.02	2.8E-02		
	Sum Bundle 03		79	21										2.404	1.173	24.82													3.0E-01	8.99E-01		
8	MG1-V	FHPUP32	2	1				100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.268		0.253	2.922	0.739	7.197	39.21	60.79	39.21	7.197	39.21	60.79	1.9E-01		
8	VT1-V	FHPUP32	2					100	1.0E-02	0.000		H04138(2)	BRASS		0.016	0.086	9	2.268		0.253	2.922	0.739	7.197	39.21	60.79	39.21	7.197	39.21	60.79	8.6E-04		
9	MG2-V	FHPUP33	2	1				100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.268		0.253	2.922	0.739	7.239	39.59	60.41	39.59	7.239	39.59	60.41	1.9E-01		
9	VT2-V	FHPUP33	2					100	1.0E-02	0.000		H04138(2)	BRASS		0.016	0.086	9	2.268		0.253	2.922	0.739	7.239	39.59	60.41	39.59	7.239	39.59	60.41	8.6E-04		
10	MG3-V	FHPUP34	2	1				100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.268		0.253	2.922	0.739	7.288	40.03	59.97	40.03	7.288	40.03	59.97	1.9E-01		
10	VT3-V	FHPUP34	2					100	1.0E-02	0.000		H04138(2)	BRASS		0.016	0.086	9	2.268		0.253	2.922	0.739	7.288	40.03	59.97	40.03	7.288	40.03	59.97	8.6E-04		
11	MG4-V	FHPUP35	2	1				100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.268		0.253	2.922	0.739	7.338	40.48	59.52	40.48	7.338	40.48	59.52	1.9E-01		
11	VT4-V	FHPUP35	2					100	1.0E-02	0.000		H04138(2)	BRASS		0.016	0.086	9	2.268		0.253	2.922	0.739	7.338	40.48	59.52	40.48	7.338	40.48	59.52	8.6E-04		
12	MG5-V	FHPUP36	2	1				100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.268		0.253	2.922	0.739	7.389	40.94	59.06	40.94	7.389	40.94	59.06	1.9E-01		
12	VT5-V	FHPUP36	2					100	1.0E-02	0.000		H04138(2)	BRASS		0.016	0.086	9	2.268		0.253	2.922	0.739	7.389	40.94	59.06	40.94	7.389	40.94	59.06	8.6E-04		
22	SFI 1-3 / D1-V	FHPUP56	3	1				25	1.0E-02	0.048	1	H05130(3)	BRASS	0.134	0.153	1.946	1.4	2.268		0.253	2.922	0.739	8.267	8.22	16.78	8.22	8.267	8.22	16.78	2.0E-02		
22	SIF-RTN1-V	FHPUP56	1					25	1.0E-02	0.333		H05130(1)	BRASS		0.051	0.128	1.4	2.268		0.253	2.922	0.739	8.267	8.22	16.78	8.22	8.267	8.22	16.78	4.7E-02		
22	SIF-TST1-V	FHPUP56	1					25	1.0E-03	0.333		H05130(1)	BRASS		0.051	0.128	1.4	2.268		0.253	2.922	0.739	8.267	8.22	16.78	8.22	8.267	8.22	16.78	4.7E-04		
22	SFI 4-7 / D1-V	FHPUP56	4	1	04		32	25	1.0E-02	0.048	1	H05130(4)	BRASS	0.128	0.204	1.81	1.4	2.268		0.253	2.922	0.739	8.267	8.22	16.78	8.22	8.267	8.22	16.78	2.7E-02		
22	SIF-RTN1-V	FHPUP56	1					25	1.0E-02	0.333		H05130(1)	BRASS		0.051	0.128	1.4	2.268		0.253	2.922	0.739	8.267	8.22	16.78	8.22	8.267	8.22	16.78	1.9E-01		
22	SIF-G1A-V / G1B-V	FHPUP56	4	1				1000	1.0E-06	0.300	1	H04138	SST	0.114	0.051	0.962	113.6	2.268		0.253	2.922	0.739	8.267	607.93	392.07	8.267	607.93	392.07	1.4E-07			
23	SFI 1-3 / D2-V	FHPUP57	3	1				25	1.0E-02	0.048	1	H05130(3)	BRASS	0.134	0.153	1.946	1.4	2.268		0.253	2.922	0.739	8.231	8.17	16.83	8.17	8.231	8.17	16.83	2.0E-02		
23	SIF-RTN2-V	FHPUP57	1					25	1.0E-02	0.333		H05130(1)	BRASS		0.051	0.128	1.4	2.268		0.253	2.922	0.739	8.231	8.17	16.83	8.17	8.231	8.17	16.83	4.7E-02		
23	SIF-TST2-V	FHPUP57	1					25	1.0E-03	0.333		H05130(1)	BRASS		0.051	0.128	1.4	2.268		0.253	2.922	0.739	8.231	8.17	16.83	8.17	8.231	8.17	16.83	4.7E-04		
23	SFI 4-7 / D2-V	FHPUP57	4	1				25	1.0E-02	0.048	1	H05130(4)	BRASS	0.128	0.204	1.81	1.4	2.268		0.253	2.922	0.739	8.231	8.17	16.83	8.17	8.231	8.17	16.83	2.7E-02		
23	SIF-RTN2-V	FHPUP57	1					25	2.0E-02	0.333		H05130(1)	BRASS		0.051	0.128	1.4	2.268		0.253	2.922	0.739	8.231	8.17	16.83	8.17	8.231	8.17	16.83	1.9E-01		
23	SIF-G2A-V / G2B-V	FHPUP57	4	1				1000	1.0E-06	0.333	1	H04138	SST	0.114	0.051	0.962	113.6	2.268		0.253	2.922	0.739	8.231	603.84	396.16	8.231	603.84	396.16	1.5E-07			
24	SFI 1-3 / D3-V	FHPUP58	3	1				25	1.0E-02	0.048	1	H05130(3)	BRASS	0.134	0.153	1.946	1.4	2.268		0.253	2.922	0.739	8.202	8.13	16.87	8.13	8.202	8.13	16.87	2.0E-02		
24	SIF-RTN3-V	FHPUP58	1					25	1.0E-02	0.333		H05130(1)	BRASS		0.051	0.128	1.4	2.268		0.253	2.922	0.739	8.202	8.13	16.87	8.13	8.202	8.13	16.87	4.7E-02		
24	SIF-TST3-V	FHPUP58	1					25	1.0E-03	0.333		H05130(1)	BRASS		0.051	0.128	1.4	2.268		0.253	2.922	0.739	8.202	8.13	16.87	8.13	8.202	8.13	16.87	4.7E-04		
24	SFI 4-7 / D3-V	FHPUP58	4	1				25	1.0E-02	0.048	1	H05130(4)	BRASS	0.128	0.204	1.81	1.4	2.268		0.253	2.922	0.739	8.202	8.13	16.87	8.13	8.202	8.13	16.87	2.7E-02		
24	SIF-RTN3-V	FHPUP58	1					25	2.0E-02	0.333		H05130(1)	BRASS		0.051	0.128	1.4	2.268		0.253	2.922	0.739	8.202	8.13	16.87	8.13	8.202	8.13	16.87	1.9E-01		
24	SIF-G3A-V / G3B-V	FHPUP58	4	1				1000	1.0E-06	0.333	1	H04138	SST	0.114	0.051	0.962	113.6	2.268		0.253	2.922	0.739	8.202	600.55	399.45	8.202	600.55	399.45	1.5E-07			
	Sum Bundle 04		62	14										1.578	1.69	21.36												1.8E+00	5.43E+00			
25	SIF-TS-IP / TS-V-P	FHPUP59	4	1				1000	5.0E-03	0.002	1	H04138	SST	0.114		0.962	113.6	2.441		0.253	2.905	0.735	8.147	596.23	403.77	8.147	596.23	403.77	2.3E-02			
25	SIF-TS-IR / TS-V-R	FHPUP60	4	1				1000	1.0E-02	0.002	1	H04138	SST	0.114		0.962	113.6	2.441		0.253	2.905	0.735	8.154	597.02	402.98	8.154	597.02	402.98	9.1E-02			
26	CP-LT-PV-P	FHPUP61	2	1				100	2.0E-05	0.333	1	H02138	BRASS	0.08	0.016	0.981	9	2.441		0.253	2.905	0.735	7.5	42.09	57.91	7.5	42.09	57.91	2.4E-06			
26	CP-ACA-P / ACB-P	FHPUP61	4	1				100	0.0E+00	0.333	1	H04138	BRASS	0.09	0.032	1.24	9	2.441		0.253	2.905	0.735	7.5	42.09	57.91	7.5	42.09	57.91	0.0E+00			
26	CP-LT-SYA-P / SYB-P	FHPUP61	3	1				1000	1.0E-02	0.333	1	H03138	SST	0.1		0.856	113.6	2.441		0.253	2.905	0.735	7.5	522.73	477.27	7.5	522.73	477.27	1.1E+01			
27	CP-LT-RY-R	FHPUP62	2	1				100	0.0E+00	0.333	1	H02138	BRASS	0.08	0.016	0.981	9	2.441		0.253	2.905	0.735	7.494	42.04	57.96	7.494	42.04	57.96	0.0E+00			
27	CP-ACA-R / ACB-R	FHPUP62	4	1				1000	1.0E-05	0.333	1	H04138	BRASS	0.09	0.032	1.24	9	2.441		0.253	2.905	0.735	7.494	42.04	57.96	7.494	42.04	57.96</				

Cable_n	Designation	Unit / Connector	no_of_wires	no_of_shd's	Bundle_No._SIH-IH-xx	U-Profile-No.	Strut-No.	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (T * t)	Cable									CVV ext. Harness SVM-CB to CVV I/F-CB			SVM Harness SVM-CB to 's			Harness total (cvv int. & ext.)			P el, avg [mW/m]	P el, Oh [mW/m]						
											no_of_cables	cable_type	condu.	Manganin mm ²	SiO ₂ mm ²	SST mm ²	Brass mm ²	Insulation mm ²	R_core Ohm/m at 300 K	Harness lth (m)	R_max (Ohm) at 300 K	R_core (Ohm)	Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K	delta R (Ohm)									
30	CS-HR-TS-IP/TS-V-P	FHFPUP65	4	1	05	2900	29	1000	1.0E-05	0.002	1	H04138	SST		0.114	0.962	113.6	2.441	277.30	0.253	2.905	0.735	7.722	547.95	452.05	9.1E-08										
30	CS-HR-TS-V-P/CR-TS-I-P	FHFPUP65	4	1				1000	1.0E-05	0.002	1	H04138	SST		0.114	0.962	113.6	2.441	277.30	0.253	2.905	0.735	7.722	547.95	452.05	9.1E-08										
31	CS-HT-R	FHFPUP66	2	1				200	0.0E+00	0.002	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	7.722	44.09	155.91	0.0E+00										
31	CS-HR-TS-IP/TS-V-R	FHFPUP66	4	1				1000	0.0E+00	0.002	1	H04138	SST		0.114	0.962	113.6	2.441	277.30	0.253	2.905	0.735	7.722	547.95	452.05	0.0E+00										
32	DP3-AC-H	FHFPUP67	2	1				100	5.0E-03	0.048	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	6.814	35.92	64.08	2.1E-02										
32	DP4-AC-H	FHFPUP67	2	1				100	5.0E-03	0.048	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	6.814	35.92	64.08	2.1E-02										
32	DP5-AC-H	FHFPUP67	2	1				100	5.0E-03	0.048	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	6.814	35.92	64.08	2.1E-02										
32	DP6-AC-H	FHFPUP67	2	1				100	5.0E-03	0.048	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	6.814	35.92	64.08	2.1E-02										
32	DP7-AC-H	FHFPUP67	2	1				100	5.0E-03	0.048	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	6.814	35.92	64.08	2.1E-02										
33	DP3-AC-V	FHFPUP68	2	1				100	5.0E-03	0.048	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	6.776	35.57	64.43	2.1E-02										
33	DP4-AC-V	FHFPUP68	2	1				100	5.0E-03	0.048	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	6.776	35.57	64.43	2.1E-02										
33	DP5-AC-V	FHFPUP68	2	1				100	5.0E-03	0.048	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	6.776	35.57	64.43	2.1E-02										
33	DP6-AC-V	FHFPUP68	2	1				100	5.0E-03	0.048	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	6.776	35.57	64.43	2.1E-02										
33	DP7-AC-V	FHFPUP68	2	1				100	5.0E-03	0.048	1	H02138	BRASS		0.08	0.981	9	2.441	21.97	0.253	2.905	0.735	6.776	35.57	64.43	2.1E-02										
34	CS-CR-TS-IP/TS-V-P	FHFPUP69	4	1				1000	1.0E-05	0.002	1	H04138	SST		0.114	0.962	113.6	2.441	277.30	0.253	2.905	0.735	7.716	547.26	452.74	9.1E-08										
			82	28											2.754	28.51																	1.2E+01	3.51E+01		
Sum Bundle 05																																				
1	Overall shield on harness bundles (Manganin-Braid)		1	1							1	COAX	SST		5.256	2.488																				
1	Overall shield on harness bundles (Manganin-Braid)		1	1							1	COAX	SST		5.256	2.488																				
1	Overall shield on harness bundles (Manganin-Braid)		1	1							1	COAX	SST		5.256	2.488																				
1	Overall shield on harness bundles (Manganin-Braid)		1	1							1	COAX	SST		5.256	2.488																				
Sum COAX															21.024	9.952																				
1	Overall shield on harness bundles (Manganin-Braid)										1	braided shield 10 mm diam.	Mng	1.512										2.429												
2	Overall shield on harness bundles (Manganin-Braid)										1	braided shield 10 mm diam.	Mng	1.512										2.394												
3	Overall shield on harness bundles (Manganin-Braid)										1	braided shield 15 mm diam.	Mng	1.872										2.297												
4	Overall shield on harness bundles (Manganin-Braid)										1	braided shield 15 mm diam.	Mng	1.872										2.268												
5	Overall shield on harness bundles (Manganin-Braid)										1	braided shield 15 mm diam.	Mng	1.872										2.441												
Sum Shields															8.64																					
Sum Bundles 01-05 & COAX & Shields															16.3	6.014	131																		15.92345	47.77034

Cable_n	Designation	Description	Unit / Connector	no_of_wires	no_of_shd's	Bundle_No_SIH-CH-xx	Upper chain	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty Cycle (T r)	Cable								no_of_cables	CVV int. Harness CVV I/F-CB to OBA CU's		SVM Harness SVM-CB to CU's			Harness total (cw int. & ext.)			P el, avg [mW/m]	P el, On [mW/m]
											no_of_cables	cabl_type	condu.	SiO2 mm²	SST mm²	Brass mm²	Insulation mm²	R_core Ohm/m at 300 K		Harness lth (m)	R_max (Ohm) at 300 K	R_core (Ohm)	Harness lth (m)	R_max (Ohm)	R_max (Ohm) total at 300 K	Harness lth (m) total	delta R (Ohm)		
1	Mixer 1-VM-H/ IM-H	FHPUP11		3	1			1000	1.0E-06	0.048	1	H05138(3)	SST		0.112	1.004	113.6	1.825	207.32	0.253	2.899	0.733	7.153	483.99	516.01	1.6E-08			
1	Mixer 1-B-H	FHPUP11		2	1			1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	1.825	207.32	0.253	2.899	0.733	7.153	483.99	516.01	6.8E-04			
2	Mixer 2-VM-H/ IM-H	FHPUP12		3	1			1000	1.0E-06	0.048	1	H05138(3)	SST		0.112	1.004	113.6	1.875	213	0.253	2.899	0.733	7.203	489.67	510.33	1.6E-08			
2	Mixer 2-B-H	FHPUP12		2	1			1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	1.875	213	0.253	2.899	0.733	7.203	489.67	510.33	6.8E-04			
3	Mixer 3-VM-H/ IM-H	FHPUP13		3	1			1000	1.0E-06	0.048	1	H05138(3)	SST		0.112	1.004	113.6	1.925	218.68	0.253	2.899	0.733	7.253	495.35	504.65	1.6E-08			
3	Mixer 3-B-H	FHPUP13		2	1			1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	1.925	218.68	0.253	2.899	0.733	7.253	495.35	504.65	6.8E-04			
4	Mixer 4-VM-H/ IM-H	FHPUP14		3	1			1000	1.0E-06	0.048	1	H05138(3)	SST		0.112	1.004	113.6	1.975	224.36	0.253	2.899	0.733	7.303	501.03	498.97	1.6E-08			
4	Mixer 4-B-H	FHPUP14		2	1			1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	1.975	224.36	0.253	2.899	0.733	7.303	501.03	498.97	6.8E-04			
5	Mixer 5-VM-H/ IM-H	FHPUP15		3	1			1000	1.0E-06	0.048	1	H05138(3)	SST		0.112	1.004	113.6	2.026	230.1536	0.253	2.899	0.733	7.354	506.82	493.18	1.6E-08			
5	Mixer 5-B-H	FHPUP15		2	1			1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	2.026	230.1536	0.253	2.899	0.733	7.354	506.82	493.18	6.8E-04			
6	Mixer 6-VM-H/ IM-H	FHPUP16		3	1			1000	1.0E-06	0.048	1	H05138(3)	SST		0.112	1.004	113.6	2.076	235.8336	0.253	2.899	0.733	7.404	512.50	487.50	1.6E-08			
6	Mixer 6-B-H	FHPUP16		2	1			1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	2.076	235.8336	0.253	2.899	0.733	7.404	512.50	487.50	6.8E-04			
7	Mixer 7-VM-H/ IM-H	FHPUP17		3	1			1000	1.0E-06	0.048	1	H05138(3)	SST		0.112	1.004	113.6	2.126	241.5136	0.253	2.899	0.733	7.454	518.18	481.82	1.6E-08			
7	Mixer 7-B-H	FHPUP17		2	1			1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	2.126	241.5136	0.253	2.899	0.733	7.454	518.18	481.82	6.8E-04			
15	FIF-G1-H/G2-H	FHPUP39		3	1			1000	1.0E-06	0.300	1	H03138	SST	0.1	0.000	0.856	113.6	1.853	210.5008	0.253	2.899	0.733	7.181	487.17	512.83	1.0E-07			
15	FIF-D1-H/ D2-H	FHPUP39		2	1			25	1.0E-02	0.050	1	H04130(2)	BRASS	0.124	0.102	1.511	1.4	1.853	2.5942	0.253	2.899	0.733	7.181	6.73	18.27	1.4E-02			
15	FIF-TST1-H	FHPUP39		1	1			25	1.0E-03	0.300		H04130(1)	BRASS	0	0.051	0.128	1.4	1.853	2.5942	0.253	2.899	0.733	7.181	6.73	18.27	4.2E-04			
15	FIF-RTN-H	FHPUP39		1	1		04	25	2.0E-02	0.050		H04130(1)	BRASS	0	0.051	0.128	1.4	1.853	2.5942	0.253	2.899	0.733	7.181	6.73	18.27	2.8E-02			
15	FIF-G1-H/G2-H	FHPUP40		3	1			1000	1.0E-06	0.300	1	H03138	SST	0.1	0.000	0.856	113.6	1.903	216.1808	0.253	2.899	0.733	7.231	492.85	507.15	1.0E-07			
15	FIF-D1-H/ D2-H	FHPUP40		2	1			25	1.0E-02	0.050	1	H03130(2)	BRASS	0	0.051	0.128	1.4	1.903	2.6642	0.253	2.899	0.733	7.231	6.80	18.20	1.4E-02			
15	FIF-RTN-H	FHPUP40		1	1			25	2.0E-02	0.050		H03130(1)	BRASS	0	0.051	0.128	1.4	1.903	2.6642	0.253	2.899	0.733	7.231	6.80	18.20	2.8E-02			
15	FIF-G1-H/G2-H	FHPUP41		3	1			1000	1.0E-06	0.300	1	H03138	SST	0.1	0.000	0.856	113.6	1.953	221.8608	0.253	2.899	0.733	7.281	498.53	501.47	1.0E-07			
15	FIF-D1-H/ D2-H	FHPUP41		2	1			25	1.0E-02	0.050	1	H03130(2)	BRASS	0.112	0.102	1.405	1.4	1.953	2.7342	0.253	2.899	0.733	7.281	6.87	18.13	1.4E-02			
15	FIF-RTN-H	FHPUP41		1	1			25	2.0E-02	0.050		H03130(1)	BRASS	0	0.051	0.128	1.4	1.953	2.7342	0.253	2.899	0.733	7.281	6.87	18.13	2.8E-02			
15	FIF-G1-H/G2-H	FHPUP42		3	1			1000	1.0E-06	0.300	1	H03138	SST	0.1	0.000	0.856	113.6	2.003	227.5408	0.253	2.899	0.733	7.331	504.21	495.79	1.0E-07			
15	FIF-D1-H/ D2-H	FHPUP42		2	1			25	1.0E-02	0.050	1	H04130(2)	BRASS	0.124	0.102	1.511	1.4	2.003	2.8042	0.253	2.899	0.733	7.331	6.94	18.06	1.4E-02			
15	FIF-RTN-H	FHPUP42		1	1			25	2.0E-02	0.050		H04130(1)	BRASS	0	0.051	0.128	1.4	2.003	2.8042	0.253	2.899	0.733	7.331	6.94	18.06	4.2E-04			
15	FIF-G1-H/G2-H	FHPUP43		3	1			1000	1.0E-06	0.300	1	H03138	SST	0.1	0.000	0.856	113.6	2.054	233.3344	0.253	2.899	0.733	7.382	510.00	490.00	1.0E-07			
15	FIF-D1-H/ D2-H	FHPUP43		2	1			25	1.0E-02	0.050	1	H03130(2)	BRASS	0.112	0.102	1.405	1.4	2.054	2.8756	0.253	2.899	0.733	7.382	7.01	17.99	2.8E-02			
15	FIF-RTN-H	FHPUP43		1	1			25	2.0E-02	0.050		H03130(1)	BRASS	0	0.051	0.128	1.4	2.054	2.8756	0.253	2.899	0.733	7.382	7.01	17.99	1.0E-07			
15	FIF-G1-H/G2-H	FHPUP44		3	1			1000	1.0E-06	0.300	1	H03138	SST	0.1	0.000	0.856	113.6	2.104	239.0144	0.253	2.899	0.733	7.432	515.68	484.32	1.0E-07			
15	FIF-D1-H/ D2-H	FHPUP44		2	1			25	1.0E-02	0.050	1	H03130(2)	BRASS	0.112	0.102	1.405	1.4	2.104	2.9456	0.253	2.899	0.733	7.432	7.08	17.92	1.4E-02			
15	FIF-RTN-H	FHPUP44		1	1			25	2.0E-02	0.050		H03130(1)	BRASS	0	0.051	0.128	1.4	2.104	2.9456	0.253	2.899	0.733	7.432	7.08	17.92	2.8E-02			
15	FIF-G1-H/G2-H	FHPUP45		3	1			1000	1.0E-06	0.300	1	H03138	SST	0.1	0.000	0.856	113.6	2.154	244.6944	0.253	2.899	0.733	7.482	521.36	478.64	1.0E-07			
15	FIF-D1-H/ D2-H	FHPUP45		2	1			25	1.0E-02	0.050	1	H03130(2)	BRASS	0.112	0.102	1.405	1.4	2.154	3.0156	0.253	2.899	0.733	7.482	7.15	17.85	1.4E-02			
15	FIF-RTN-H	FHPUP45		1	1			25	2.0E-02	0.050		H03130(1)	BRASS	0	0.051	0.128	1.4	2.154	3.0156	0.253	2.899	0.733	7.482	7.15	17.85	2.8E-02			
Sum Bundle 01																2.404					24.821						9.0E-01		
8	MG1-H	FHPUP25		2	1			100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	1.87	16.83	0.253	3.067	0.776	7.331	39.15	60.85	1.9E-01			
8	HT1-H	FHPUP25		2	1			100	1.0E-02	0.000		H04138(2)	BRASS	0	0.016	0.086	9	1.87	16.83	0.253	3.067	0.776	7.331	39.15	60.85	8.6E-04			
9	MG2-H	FHPUP26		2	1			100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	1.92	17.28	0.253	3.067	0.776	7.381	39.60	60.40	1.9E-01			
9	HT2-H	FHPUP26		2	1			100	1.0E-02	0.000		H04138(2)	BRASS	0	0.016	0.086	9	1.92	17.28	0.253	3.067	0.776	7.381	39.60	60.40	8.6E-04			
10	MG3-H	FHPUP27		2	1			100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	1.97	17.73	0.253	3.067	0.776	7.431	40.05	59.95	1.9E-01			
10	HT3-H	FHPUP27		2	1			100	1.0E-02	0.000		H04138(2)	BRASS	0	0.016	0.086	9	1.97	17.73	0.253	3.067	0.776	7.431	40.05	59.95	8.6E-04			
11	MG4-H	FHPUP28		2	1			100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.02	18.18	0.253	3.067	0.776	7.481	40.50	59.50	1.9E-01			
11	HT4-H	FHPUP28		2	1			100	1.0E-02	0.000		H04138(2)	BRASS	0	0.016	0.086	9	2.02	18.18	0.253	3.067	0.776	7.481	40.50	59.50	8.6E-04			
12	MG5-H	FHPUP29		2	1			100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.071	18.639	0.253	3.067	0.776	7.532	40.96	59.04	1.9E-01			
12	HT5-H	FHPUP29		2	1			100	1.0E-02	0.000		H04138(2)	BRASS	0	0.016	0.086	9	2.071	18.639	0.253	3.067	0.776	7.532	40.96	59.04	8.6E-04			
22	SFI 1-3/ D1-H	FHPUP53		3	1			25	1.0E-02	0.048	1	H05130(3)	BRASS	0.134	0.153	1.946	1.4	3.002	4.2028	0.253	3.067	0.776	8.463	16.67	2.0E-02				
22	SIF-RTN1-H	FHPUP53		1	1			25	1.0E-02	0.333		H05130(1)	BRASS	0	0.051	0.128	1.4	3.002	4.										

Cable_n	Designation		no_of_wires	no_of_shd's	Bundle_No_SIH-CH-xx	Upper chain	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (T t)	Cable									CVV int. Harness CVV I/F-CB to OBA CU's			SVM Harness SVM-CB to CU			Harness total (cvw int. & ext.)			P el, On [mW/m]	P el, avg [mW/m]	
	Description	Unit / Connector								no_of_cables	cabl_type	condu.	SiO2 mm²	SST mm²	Brass mm²	Insulation mm²	R_core Ohm/m at 300 K	Harness lth (m)	R_max (Ohm) at 300 K	R_core (Ohm)	Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K	delta R (Ohm)					
22	SIF-RTN1-H	FHFPUP53	1		02	04	25	2.0E-02	0.333		H05130(1)	BRASS		0	0.051	0.079	1.4	3.002	4.2028	0.253	3.067	0.776	8.463	8.33	16.67	1.9E-01				
22	SIF-G1A-H/G1B-H	FHFPUP53	4	1			1000	1.0E-06	0.300		H04138	SST		0.107	0.962	113.6	3.002	341.0272	0.253	3.067	0.776	8.463	613.76	386.24	1.4E-07					
23	SFI 1-3 / D2-H	FHFPUP54	3	1			25	1.0E-02	0.048		H05130(3)	BRASS		0.134	0.153	1.946	3.021	4.2294	0.253	3.067	0.776	8.482	8.36	16.64	2.0E-02					
23	SIF-RTN2-H	FHFPUP54	1				25	1.0E-02	0.333		H05130(1)	BRASS		0	0.051	0.128	1.4	3.021	4.2294	0.253	3.067	0.776	8.482	8.36	16.64	4.7E-02				
23	SIF-TST2-H	FHFPUP54	1				25	1.0E-03	0.333		H05130(1)	BRASS		0	0.051	0.128	1.4	3.021	4.2294	0.253	3.067	0.776	8.482	8.36	16.64	4.7E-04				
23	SFI 4-7 / D2-H	FHFPUP54	4	1			25	1.0E-02	0.048		H05130(4)	BRASS		0.134	0.204	2.074	3.021	4.2294	0.253	3.067	0.776	8.482	8.36	16.64	2.7E-02					
23	SIF-RTN2-H	FHFPUP54	1				25	2.0E-02	0.333		H05130(1)	BRASS		0	0.051	0.128	1.4	3.021	4.2294	0.253	3.067	0.776	8.482	8.36	16.64	1.9E-01				
23	SIF-G2A-H / G2B-H	FHFPUP54	4	1			1000	1.0E-06	0.300		H04138	SST		0.107	0.962	113.6	3.021	343.1856	0.253	3.067	0.776	8.482	615.92	384.08	1.4E-07					
24	SFI 1-3 / D3-H	FHFPUP55	3	1			25	1.0E-02	0.048		H05130(3)	BRASS		0.134	0.153	1.946	3.064	4.2896	0.253	3.067	0.776	8.525	8.42	16.58	2.0E-02					
24	SIF-RTN3-H	FHFPUP55	1				25	1.0E-03	0.333		H05130(1)	BRASS		0	0.051	0.128	1.4	3.064	4.2896	0.253	3.067	0.776	8.525	8.42	16.58	4.7E-02				
24	SIF-TST3-H	FHFPUP55	1				25	1.0E-03	0.333		H05130(1)	BRASS		0	0.051	0.128	1.4	3.064	4.2896	0.253	3.067	0.776	8.525	8.42	16.58	4.7E-04				
24	SFI 4-7 / D3-H	FHFPUP55	4	1			25	1.0E-02	0.048		H05130(4)	BRASS		0.134	0.204	2.074	3.064	4.2896	0.253	3.067	0.776	8.525	8.42	16.58	2.7E-02					
24	SIF-RTN3-H	FHFPUP55	1				25	2.0E-02	0.333		H05130(1)	BRASS		0	0.051	0.128	1.4	3.064	4.2896	0.253	3.067	0.776	8.525	8.42	16.58	1.9E-01				
24	SIF-G3A-H / G3B-H	FHFPUP55	4	1			1000	1.0E-06	0.300		H04138	SST		0.107	0.962	113.6	3.064	348.0704	0.253	3.067	0.776	8.525	620.80	379.20	1.4E-07					
Sum Bundle 02															1.569	21.985												1.8E+00	5.4E+00	
1	Mixer 1-VM-V / IM-V	FHFPUP18	3	1			1000	1.0E-06	0.048		H05138(3)	SST		0.112	1.004	113.6	1.876	213.1136	0.253	2.852	0.722	7.025	474.77	525.23	1.6E-08					
1	Mixer 1-B-V	FHFPUP18	2				1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	1.876	213.1136	0.253	2.852	0.722	7.025	474.77	525.23	6.8E-04					
2	Mixer 2-VM-V / IM-V	FHFPUP19	3	1			1000	1.0E-06	0.048		H05138(3)	SST		0.112	1.004	113.6	1.881	213.6816	0.253	2.852	0.722	7.03	475.34	524.66	1.6E-08					
2	Mixer 2-B-V	FHFPUP19	2				1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	1.881	213.6816	0.253	2.852	0.722	7.03	475.34	524.66	6.8E-04					
3	Mixer 3-VM-V / IM-V	FHFPUP20	3	1			1000	1.0E-06	0.048		H05138(3)	SST		0.112	1.004	113.6	1.922	218.3392	0.253	2.852	0.722	7.071	480.00	520.00	1.6E-08					
3	Mixer 3-B-V	FHFPUP20	2				1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	1.922	218.3392	0.253	2.852	0.722	7.071	480.00	520.00	6.8E-04					
4	Mixer 4-VM-V / IM-V	FHFPUP21	3	1			1000	1.0E-06	0.048		H05138(3)	SST		0.112	1.004	113.6	1.927	218.9072	0.253	2.852	0.722	7.076	480.57	519.43	1.6E-08					
4	Mixer 4-B-V	FHFPUP21	2				1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	1.927	218.9072	0.253	2.852	0.722	7.076	480.57	519.43	6.8E-04					
5	Mixer 5-VM-V / IM-V	FHFPUP22	3	1			1000	1.0E-06	0.048		H05138(3)	SST		0.112	1.004	113.6	1.974	224.2464	0.253	2.852	0.722	7.123	485.91	514.09	1.6E-08					
5	Mixer 5-B-V	FHFPUP22	2				1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	1.974	224.2464	0.253	2.852	0.722	7.123	485.91	514.09	6.8E-04					
6	Mixer 6-VM-V / IM-V	FHFPUP23	3	1			1000	1.0E-06	0.048		H05138(3)	SST		0.112	1.004	113.6	1.977	224.5872	0.253	2.852	0.722	7.126	486.25	513.75	1.6E-08					
6	Mixer 6-B-V	FHFPUP23	2				1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	1.977	224.5872	0.253	2.852	0.722	7.126	486.25	513.75	6.8E-04					
7	Mixer 7-VM-V / IM-V	FHFPUP24	3	1			1000	1.0E-06	0.048		H05138(3)	SST		0.112	1.004	113.6	2.024	229.9264	0.253	2.852	0.722	7.173	491.59	508.41	1.6E-08					
7	Mixer 7-B-V	FHFPUP24	2				1000	2.5E-04	0.048		H05138(2)	SST		0.016	0.086	113.6	2.024	229.9264	0.253	2.852	0.722	7.173	491.59	508.41	6.8E-04					
15	FIF-G1-V / G2-V	FHFPUP46	3	1			1000	1.0E-06	0.300		H03138	SST		0.1	0.000	0.856	2.028	230.3808	0.253	2.852	0.722	7.177	492.04	507.96	1.0E-07					
15	FIF-D1-V / D2-V	FHFPUP46	2	1			25	1.0E-02	0.050		H04130(2)	BRASS		0.124	0.102	1.511	2.028	2.8392	0.253	2.852	0.722	7.177	6.78	18.22	1.4E-02					
15	FIF-TST1-V	FHFPUP46	1				25	1.0E-03	0.300		H04130(1)	BRASS		0	0.051	0.128	1.4	2.028	2.8392	0.253	2.852	0.722	7.177	6.78	18.22	4.2E-04				
15	FIF-RTN-V	FHFPUP46	1				25	2.0E-02	0.050		H04130(1)	BRASS		0	0.051	0.128	1.4	2.028	2.8392	0.253	2.852	0.722	7.177	6.78	18.22	2.8E-02				
16	FIF-G1-V / G2-V	FHFPUP47	3	1	03		1000	1.0E-06	0.300		H03138	SST		0.1	0.000	0.856	2.075	235.72	0.253	2.852	0.722	7.224	497.38	502.62	1.0E-07					
16	FIF-D1-V / D2-V	FHFPUP47	2	1			25	1.0E-02	0.050		H03130(2)	BRASS		0.112	0.102	1.405	2.075	2.905	0.253	2.852	0.722	7.224	6.84	18.16	1.4E-02					
16	FIF-RTN-V	FHFPUP47	1				25	2.0E-02	0.050		H03130(1)	BRASS		0	0.051	0.128	1.4	2.075	2.905	0.253	2.852	0.722	7.224	6.84	18.16	2.8E-02				
17	FIF-G1-V / G2-V	FHFPUP48	3	1			1000	1.0E-06	0.300		H03138	SST		0.1	0.000	0.856	2.078	236.0608	0.253	2.852	0.722	7.227	497.72	502.28	1.0E-07					
17	FIF-D1-V / D2-V	FHFPUP48	2	1			25	1.0E-02	0.050		H03130(2)	BRASS		0.112	0.102	1.405	2.078	2.9092	0.253	2.852	0.722	7.227	6.85	18.15	1.4E-02					
17	FIF-RTN-V	FHFPUP48	1				25	2.0E-02	0.050		H03130(1)	BRASS		0	0.051	0.128	1.4	2.078	2.9092	0.253	2.852	0.722	7.227	6.85	18.15	2.8E-02				
18	FIF-G1-V / G2-V	FHFPUP49	3	1			1000	1.0E-06	0.300		H03138	SST		0.1	0.000	0.856	2.123	241.1728	0.253	2.852	0.722	7.272	502.83	497.17	1.0E-07					
18	FIF-D1-V / D2-V	FHFPUP49	2	1			25	1.0E-02	0.050		H04130(2)	BRASS		0.124	0.102	1.511	2.123	2.9722	0.253	2.852	0.722	7.272	6.91	18.09	1.4E-02					
18	FIF-TST2-V	FHFPUP49	1				25	1.0E-03	0.300		H04130(1)	BRASS		0	0.051	0.128	1.4	2.123	2.9722	0.253	2.852	0.722	7.272	6.91	18.09	4.2E-04				
18	FIF-RTN-V	FHFPUP49	1				25	2.0E-02	0.050		H04130(1)	BRASS		0	0.051	0.128	1.4	2.123	2.9722	0.253	2.852	0.722	7.272	6.91	18.09	2.8E-02				
19	FIF-G1-V / G2-V	FHFPUP50	3	1			1000	1.0E-06	0.300		H03138	SST		0.1	0.000	0.856	2.128	241.7408	0.253	2.852	0.722	7.277	503.40	496.60	1.0E-07					
19	FIF-D1-V / D2-V	FHFPUP50	2	1			25	1.0E-02	0.050		H03130(2)	BRASS		0.112	0.102	1.405	2.128	2.9792	0.253	2.852	0.722	7.277	6.92	18.08	1.4E-02					
19	FIF-RTN-V	FHFPUP50	1				25	2.0E-02	0.050		H03130(1)	BRASS		0	0.051	0.128	1.4	2.128	2.9792	0.253	2.852	0.722	7.277	6.92	18.08	2.8E-02				

Cable_n	Designation		no_of_wires	no_of_shd's	Bundle_No_SIH-CH-xx	Upper chain	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (T + 1)	Cable								CVV int. Harness CVV I/F-CB to OBA CU's		SVM Harness SVM-CB to CU			Harness total (cvw int. & ext.)			P el, On [mW/m]	P el, avg [mW/m]
	Description	Unit / Connector								no_of_cables	no_of_cables	condu.	SiO2 mm²	SST mm²	Brass mm²	Insulation mm²	R_core Ohm/m at 300 K	Harness lth (m)	R_max (Ohm) at 300 K	R_core (Ohm)	Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K	delta R (Ohm)		
20	FIF-G1-V / G2-V	FHFPUP51	3	1			1000	1.0E-06	0.300	1	H03138	SST	0.1	0.000	0.856	113.6	2.162	245.6032	0.253	2.852	0.722	7.311	507.26	492.74	1.0E-07		
20	FIF6-D1-V / D2-V	FHFPUP51	2	1			25	1.0E-02	0.050	1	H03130(2)	BRASS	0.112	0.102	1.405	1.4	2.162	3.0268	0.253	2.852	0.722	7.311	6.96	18.04	1.4E-02		
20	FIF-RTN-V	FHFPUP51	1				25	2.0E-02	0.050		H03130(1)	BRASS	0	0.051	0.128	1.4	2.162	3.0268	0.253	2.852	0.722	7.311	6.96	18.04	2.8E-02		
21	FIF-G1-V / G2-V	FHFPUP52	3	1			1000	1.0E-06	0.300	1	H03138	SST	0.1	0.000	0.856	113.6	2.172	246.7392	0.253	2.852	0.722	7.321	508.40	491.60	1.0E-07		
21	FIF7-D1-V / D2-V	FHFPUP52	2	1			25	1.0E-02	0.050	1	H03130(2)	BRASS	0.112	0.102	1.405	1.4	2.172	3.0408	0.253	2.852	0.722	7.321	6.98	18.02	1.4E-02		
21	FIF-RTN-V	FHFPUP52	1				25	2.0E-02	0.050		H03130(1)	BRASS	0	0.051	0.128	1.4	2.172	3.0408	0.253	2.852	0.722	7.321	6.98	18.02	2.8E-02		
	Sum Bundle 03												2.404	1.173	24.821										3.0E-01	9.0E-01	
8	MG1-V	FHFPUP32	2	1			100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.007	18.063	0.253	2.922	0.739	7.197	39.21	60.79	1.9E-01		
8	VT1-V	FHFPUP32	2				100	1.0E-02	0.000		H04138(2)	BRASS	0	0.016	0.086	9	2.007	18.063	0.253	2.922	0.739	7.197	39.21	60.79	8.6E-04		
9	MG2-V	FHFPUP33	2	1			100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.049	18.441	0.253	2.922	0.739	7.239	39.59	60.41	1.9E-01		
9	VT2-V	FHFPUP33	2				100	1.0E-02	0.000		H04138(2)	BRASS	0	0.016	0.086	9	2.049	18.441	0.253	2.922	0.739	7.239	39.59	60.41	8.6E-04		
10	MG3-V	FHFPUP34	2	1			100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.098	18.882	0.253	2.922	0.739	7.288	40.03	59.97	1.9E-01		
10	VT3-V	FHFPUP34	2				100	1.0E-02	0.000		H04138(2)	BRASS	0	0.016	0.086	9	2.098	18.882	0.253	2.922	0.739	7.288	40.03	59.97	8.6E-04		
11	MG4-V	FHFPUP35	2	1			100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.148	19.332	0.253	2.922	0.739	7.338	40.48	59.52	1.9E-01		
11	VT4-V	FHFPUP35	2				100	1.0E-02	0.000		H04138(2)	BRASS	0	0.016	0.086	9	2.148	19.332	0.253	2.922	0.739	7.338	40.48	59.52	8.6E-04		
12	MG5-V	FHFPUP36	2	1			100	1.5E-02	0.048	1	H04138(2)	BRASS	0.09	0.016	1.154	9	2.199	19.791	0.253	2.922	0.739	7.389	40.94	59.06	1.9E-01		
12	VT5-V	FHFPUP36	2				100	1.0E-02	0.000		H04138(2)	BRASS	0	0.016	0.086	9	2.199	19.791	0.253	2.922	0.739	7.389	40.94	59.06	8.6E-04		
22	SFI 1-3 / D1-V	FHFPUP56	3	1			25	1.0E-02	0.048	1	H05130(3)	BRASS	0.134	0.153	1.946	1.4	3.077	4.3078	0.253	2.922	0.739	8.267	8.22	16.78	2.0E-02		
22	SIF-RTN1-V	FHFPUP56	1				25	1.0E-02	0.333		H05130(1)	BRASS	0	0.051	0.128	1.4	3.077	4.3078	0.253	2.922	0.739	8.267	8.22	16.78	4.7E-02		
22	SIF-TST1-V	FHFPUP56	1				25	1.0E-03	0.333		H05130(1)	BRASS	0	0.051	0.128	1.4	3.077	4.3078	0.253	2.922	0.739	8.267	8.22	16.78	4.7E-04		
22	SFI 4-7 / D1-V	FHFPUP56	4	1	04		25	1.0E-02	0.048	1	H05130(4)	BRASS	0.128	0.204	1.81	1.4	3.077	4.3078	0.253	2.922	0.739	8.267	8.22	16.78	2.7E-02		
22	SIF-RTN1-V	FHFPUP56	1		04		25	2.0E-02	0.333		H05130(1)	BRASS	0	0.051	0.079	1.4	3.077	4.3078	0.253	2.922	0.739	8.267	8.22	16.78	1.9E-01		
22	SIF-G1A-V / G1B-V	FHFPUP56	4	1			1000	1.0E-06	0.300	1	H04138	SST	0.107		0.962	113.6	3.077	349.5472	0.253	2.922	0.739	8.267	607.93	392.07	1.4E-07		
23	SFI 1-3 / D2-V	FHFPUP57	3	1			25	1.0E-02	0.048	1	H05130(3)	BRASS	0.134	0.153	1.946	1.4	3.041	4.2574	0.253	2.922	0.739	8.231	8.17	16.83	2.0E-02		
23	SIF-RTN2-V	FHFPUP57	1				25	1.0E-02	0.333		H05130(1)	BRASS	0	0.051	0.128	1.4	3.041	4.2574	0.253	2.922	0.739	8.231	8.17	16.83	4.7E-02		
23	SIF-TST2-V	FHFPUP57	1				25	1.0E-03	0.333		H05130(1)	BRASS	0	0.051	0.128	1.4	3.041	4.2574	0.253	2.922	0.739	8.231	8.17	16.83	4.7E-04		
23	SFI 4-7 / D2-V	FHFPUP57	4	1			25	1.0E-02	0.048	1	H05130(4)	BRASS	0.128	0.204	1.81	1.4	3.041	4.2574	0.253	2.922	0.739	8.231	8.17	16.83	2.7E-02		
23	SIF-RTN2-V	FHFPUP57	1				25	2.0E-02	0.333		H05130(1)	BRASS	0	0.051	0.079	1.4	3.041	4.2574	0.253	2.922	0.739	8.231	8.17	16.83	1.9E-01		
23	SIF-G2A-V / G2B-V	FHFPUP57	4	1			1000	1.0E-06	0.300	1	H04138	SST	0.107		0.962	113.6	3.041	345.4576	0.253	2.922	0.739	8.231	603.84	396.16	1.4E-07		
24	SFI 1-3 / D3-V	FHFPUP58	3	1			25	1.0E-02	0.048	1	H05130(3)	BRASS	0.134	0.153	1.946	1.4	3.012	4.2168	0.253	2.922	0.739	8.202	8.13	16.87	2.0E-02		

Cable_n	Designation	Description	Unit / Connector	no_of_wires	no_of_shd's	Bundle_No._SIIH-xx	U-Profile-No.	Strut-No.	R_max_core (Ohm) at 300 K	L_nominal (A)	Duty_Cycle (T %)	Cable								no_of_cables	cable_type	condu.	Manganin mm ²	SiO2mm ²	SST mm ²	Brass mm ²	Insulation mm ²	R_core Ohm/m at 300 K	CVV ext. Harness SVM-CB to CVV I/F-CB		SVM Harness SVM-CB to 's			Harness total (cvv int. & ext.)			P el, avg [mW/m]	P el, On [mW/m]
												no_of_cables	Insulation mm ²	Brass mm ²	SiO2mm ²	SST mm ²	Brass mm ²	Insulation mm ²	R_core (Ohm)										Harness lth (m)	R_max (Ohm)	Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K	delta R (Ohm)			
21	FIF7-D1-V / D2-V		FHFPUP52	2	1				25 1.0E-02	0.050	0.050	1	H03130(2)	BRASS		0.112	0.102	1.405	1.4	2.297			3.22	0.253	2.852	0.722	7.321	6.98	18.02	1.4E-02								
21	FIF-RTN-V		FHFPUP52	1					25 2.0E-02	0.050			H03130(1)	BRASS			0.051	1.4	2.297			3.22	0.253	2.852	0.722	7.321	6.98	18.02	2.8E-02									
	Sum Bundle 03			79	21											2.404	1.173	24.82											3.0E-01	8.99E-01								
8	MG1-V		FHFPUP32	2	1				100 1.5E-02	0.048	0.048	1	H04138(2)	BRASS		0.09	0.016	1.154	9	2.268			20.41	0.253	2.922	0.739	7.197	39.21	60.79	1.9E-01								
8	VT1-V		FHFPUP32	2					100 1.0E-02	0.048	0.048	1	H04138(2)	BRASS		0.09	0.016	0.086	9	2.268			20.41	0.253	2.922	0.739	7.197	39.21	60.79	8.6E-04								
9	MG2-V		FHFPUP33	2	1				100 1.5E-02	0.048	0.048	1	H04138(2)	BRASS		0.09	0.016	1.154	9	2.268			20.41	0.253	2.922	0.739	7.239	39.59	60.41	1.9E-01								
9	VT2-V		FHFPUP33	2					100 1.0E-02	0.048	0.048	1	H04138(2)	BRASS		0.09	0.016	0.086	9	2.268			20.41	0.253	2.922	0.739	7.239	39.59	60.41	8.6E-04								
10	MG3-V		FHFPUP34	2	1				100 1.5E-02	0.048	0.048	1	H04138(2)	BRASS		0.09	0.016	1.154	9	2.268			20.41	0.253	2.922	0.739	7.288	40.03	59.97	1.9E-01								
10	VT3-V		FHFPUP34	2					100 1.0E-02	0.048	0.048	1	H04138(2)	BRASS		0.09	0.016	0.086	9	2.268			20.41	0.253	2.922	0.739	7.288	40.03	59.97	8.6E-04								
11	MG4-V		FHFPUP35	2	1				100 1.5E-02	0.048	0.048	1	H04138(2)	BRASS		0.09	0.016	1.154	9	2.268			20.41	0.253	2.922	0.739	7.338	40.48	59.52	1.9E-01								
11	VT4-V		FHFPUP35	2					100 1.0E-02	0.048	0.048	1	H04138(2)	BRASS		0.09	0.016	0.086	9	2.268			20.41	0.253	2.922	0.739	7.338	40.48	59.52	8.6E-04								
12	MG5-V		FHFPUP36	2	1				100 1.5E-02	0.048	0.048	1	H04138(2)	BRASS		0.09	0.016	1.154	9	2.268			20.41	0.253	2.922	0.739	7.389	40.94	59.06	1.9E-01								
12	VT5-V		FHFPUP36	2					100 1.0E-02	0.048	0.048	1	H04138(2)	BRASS		0.09	0.016	0.086	9	2.268			20.41	0.253	2.922	0.739	7.389	40.94	59.06	8.6E-04								
22	SFI 1-3 / D1-V		FHFPUP56	3	1				25 1.0E-02	0.048	0.048	1	H05130(3)	BRASS		0.134	0.153	1.946	1.4	2.268			3.18	0.253	2.922	0.739	8.267	8.22	16.78	2.0E-02								
22	SFI-RTN1-V		FHFPUP56	1					25 1.0E-02	0.333	0.333	1	H05130(1)	BRASS		0.051	0.051	0.128	1.4	2.268			3.18	0.253	2.922	0.739	8.267	8.22	16.78	4.7E-02								
22	SFI-TST1-V		FHFPUP56	1					25 1.0E-03	0.333	0.333	1	H05130(1)	BRASS		0.051	0.051	0.128	1.4	2.268			3.18	0.253	2.922	0.739	8.267	8.22	16.78	4.7E-04								
22	SFI 4-7 / D1-V		FHFPUP56	4	1		04	3132	25 1.0E-02	0.048	0.048	1	H05130(4)	BRASS		0.128	0.204	0.181	1.4	2.268			3.18	0.253	2.922	0.739	8.267	8.22	16.78	2.7E-02								
22	SFI-RTN1-V		FHFPUP56	1					25 2.0E-02	0.333	0.333	1	H05130(1)	BRASS		0.051	0.051	0.079	1.4	2.268			3.18	0.253	2.922	0.739	8.267	8.22	16.78	1.9E-01								
22	SFI-G1A-V / G1B-V		FHFPUP56	4	1				1000 1.0E-06	0.300	0.300	1	H04138	SST		0.114	0.051	0.962	113.6	2.268			257.64	0.253	2.922	0.739	8.267	607.93	392.07	1.4E-07								
23	SFI 1-3 / D2-V		FHFPUP57	3	1				25 1.0E-02	0.048	0.048	1	H05130(3)	BRASS		0.134	0.153	1.946	1.4	2.268			3.18	0.253	2.922	0.739	8.231	8.17	16.83	2.0E-02								
23	SFI-RTN2-V		FHFPUP57	1					25 1.0E-02	0.333	0.333	1	H05130(1)	BRASS		0.051	0.051	0.128	1.4	2.268			3.18	0.253	2.922	0.739	8.231	8.17	16.83	4.7E-02								
23	SFI-TST2-V		FHFPUP57	1					25 1.0E-03	0.333	0.333	1	H05130(1)	BRASS		0.051	0.051	0.128	1.4	2.268			3.18	0.253	2.922	0.739	8.231	8.17	16.83	4.7E-04								
23	SFI 4-7 / D2-V		FHFPUP57	4	1				25 1.0E-02	0.048	0.048	1	H05130(4)	BRASS		0.128	0.204	0.181	1.4	2.268			3.18	0.253	2.922	0.739	8.231	8.17	16.83	2.7E-02								
23	SFI-RTN2-V		FHFPUP57	1					25 2.0E-02	0.333	0.333	1	H05130(1)	BRASS		0.051	0.051	0.079	1.4	2.268			3.18	0.253	2.922	0.739	8.231	8.17	16.83	1.9E-01								
23	SFI-G2A-V / G2B-V		FHFPUP57	4	1				1000 1.0E-06	0.333	0.333	1	H04138	SST		0.114	0.051	0.962	113.6	2.268			257.64	0.253	2.922	0.739	8.231	8.17	16.83	1.5E-07								
24	SFI 1-3 / D3-V		FHFPUP58	3	1				25 1.0E-02	0.048	0.048	1	H05130(3)	BRASS		0.134	0.153	1.946	1.4	2.268			3.18	0.253	2.922	0.739	8.202	8.13	16.87	2.0E-02								
24	SFI-RTN3-V		FHFPUP58	1					25 1.0E-02	0.333	0.333	1	H05130(1)	BRASS		0.051	0.051	0.128	1.4	2.268			3.18	0.253	2.922	0.739	8.202	8.13	16.87	4.7E-02								
24	SFI-TST3-V		FHFPUP58	1					25 1.0E-03	0.333	0.333	1	H05130(1)	BRASS		0.051	0.051	0.128	1.4	2.268			3.18	0.253	2.922	0.739	8.202	8.13	16.87	4.7E-04								
24	SFI 4-7 / D3-V		FHFPUP58	4	1				25 1.0E-02	0.048	0.048	1	H05130(4)	BRASS		0.128	0.204	0.181	1.4	2.268			3.18	0.253	2.922	0.739	8.202	8.13	16.87	2.7E-02								
24	SFI-RTN3-V		FHFPUP58	1					25 2.0E-02	0.333	0.333	1	H05130(1)	BRASS		0.051	0.051	0.079	1.4	2.268			3.18	0.253	2.922	0.739	8.202	8.13	16.87	1.9E-01								
24	SFI-G3A-V / G3B-V		FHFPUP58	4	1				1000 1.0E-06	0.333	0.333	1	H04138	SST		0.114	0.051	0.962	113.6	2.268			257.64	0.253	2.922	0.739	8.202	600.55	399.45	1.5E-07								
	Sum Bundle 04			62	14											1.578	1.69	21.36										1.8E+00	5.43E+00									
25	SIF-TS-IP / TS-V-P		FHFPUP59	4	1				1000 5.0E-03	0.002	0.002	1	H04138	SST		0.114		0.962	113.6	2.441			277.30	0.253	2.905	0.735	8.147	596.23	403.77	2.3E-02								
25	SIF-TS-H-R / TS-V-R		FHFPUP60	4	1				1000 1.0E-02	0.002	0.002	1	H04138	SST		0.114		0.962	113.6	2.441			277.30	0.253	2.905	0.735	8.154	597.02	402.98	9.1E-02								
26	CP-LT-PY-P		FHFPUP61	2	1				100 2.0E-05	0.333	0.333	1	H02138	BRASS		0.08	0.016	0.981	9	2.441			21.97	0.253	2.905	0.735	7.5	42.09	57.91	2.4E-06								
26	CP-ACA-P / ACB-P		FHFPUP61	4	1				100 0.0E+00	0.333	0.333	1	H04138	BRASS		0.09	0.032	1.24	9	2.441			21.97	0.253	2.905	0.735	7.5	42.09	57.91	0.0E+00								
26	CP-LT-SVA-P / SYB-P		FHFPUP61	3	1				1000 1.0E-02	0.333	0.333	1	H03138	SST		0.1	0.856	113.6	9	2.441			277.30	0.253	2.905	0.735	7.5	522.73	477.27	1.1E+01								
27	CP-LT-RY-R		FHFPUP62	2	1				100 0.0E+00	0.333	0.333	1	H02138	BRASS		0.08	0.016	0.981	9	2.441			21.97	0.253	2.905	0.735	7.494	42.04	57.96	0.0E+00								
27	CP-ACA-R / ACB-R		FHFPUP62	4	1				100 1.0E-05	0.333	0.333	1	H04138	BRASS		0.09	0.032	1.24	9	2.441			21.97	0.253	2.905	0.735	7.494	42.04	57.96	1.2E-06								
27	CP-LT-SVA-R / TS-R		FHFPUP62	3	1				1000 1.0E-05																													

Cable_n	Designation		no_of_wires	no_of_shd's	Bundle_No._SIH-IH-xx	U-Profile-No.	Strut-No.	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (T * t)	Cable								CVV ext. Harness SVM-CB to CVV I/F-CB		SVM Harness SVM-CB to 's			Harness total (cvv int. & ext.)			P el, avg [mW/m]	P el, On [mW/m]			
	Description	Unit / Connector									no_of_cables	cable_type	condu.	Manganin mm²	SiO2mm²	SST mm²	Brass mm²	Insulation mm²	R_core Ohm/m at 300 K	Harness lth (m)	R_max (Ohm) at 300 K	R_core (Ohm)	Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K			delta R (Ohm)		
30	CS-HR-TS-I/PTS-V-P	FHFUP65	4	1	05	2900	29	1000	1.0E-05	0.002	1	H04138	SST				0.114	0.962	113.6	277.30	0.253	2.905	0.735	7.722	547.95	452.05	9.1E-08				
30	CS-HR-TS-V-P / CR-TS-I-P	FHFUP65	4	1				1000	1.0E-05	0.002	1	H04138	SST				0.114	0.962	113.6	277.30	0.253	2.905	0.735	7.722	547.95	452.05	9.1E-08				
31	CS-HT-R	FHFUP66	2	1				200	0.0E+00	0.002	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	7.722	44.09	155.91	0.0E+00					
31	CS-HR-TS-I/PTS-V-R	FHFUP66	4	1				1000	0.0E+00	0.002	1	H04138	SST				0.114	0.962	113.6	277.30	0.253	2.905	0.735	7.722	547.95	452.05	0.0E+00				
32	DP3-AC-H	FHFUP67	2	1				100	5.0E-03	0.048	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	6.814	35.92	64.08	2.1E-02					
32	DP4-AC-H	FHFUP67	2	1				100	5.0E-03	0.048	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	6.814	35.92	64.08	2.1E-02					
32	DP5-AC-H	FHFUP67	2	1				100	5.0E-03	0.048	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	6.814	35.92	64.08	2.1E-02					
32	DP6-AC-H	FHFUP67	2	1				100	5.0E-03	0.048	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	6.814	35.92	64.08	2.1E-02					
32	DP7-AC-H	FHFUP67	2	1				100	5.0E-03	0.048	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	6.814	35.92	64.08	2.1E-02					
33	DP3-AC-V	FHFUP68	2	1				100	5.0E-03	0.048	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	6.776	35.57	64.43	2.1E-02					
33	DP4-AC-V	FHFUP68	2	1				100	5.0E-03	0.048	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	6.776	35.57	64.43	2.1E-02					
33	DP5-AC-V	FHFUP68	2	1				100	5.0E-03	0.048	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	6.776	35.57	64.43	2.1E-02					
33	DP6-AC-V	FHFUP68	2	1				100	5.0E-03	0.048	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	6.776	35.57	64.43	2.1E-02					
33	DP7-AC-V	FHFUP68	2	1				100	5.0E-03	0.048	1	H02138	BRASS			0.08	0.016	9	21.97	0.253	2.905	0.735	6.776	35.57	64.43	2.1E-02					
34	CS-CR-TS-I/PTS-V-P	FHFUP69	4	1				1000	1.0E-05	0.002	1	H04138	SST			0.114	0.962	113.6	277.30	0.253	2.905	0.735	7.716	547.26	452.74	9.1E-08					
	Sum Bundle 05		82	28												2.754	0.288	28.51									1.2E+01	3.51E+01			
1	Overall shield on harness bundles (Manganin-Braid)			1							1	COAX	SST			5.256	1.399	2.488													
2	Overall shield on harness bundles (Manganin-Braid)			1							1	COAX	SST			5.256	1.399	2.488													
3	Overall shield on harness bundles (Manganin-Braid)			1							1	COAX	SST			5.256	1.399	2.488													
4	Overall shield on harness bundles (Manganin-Braid)			1							1	COAX	SST			5.256	1.399	2.488													
5	Overall shield on harness bundles (Manganin-Braid)			1							1	COAX	SST			5.256	1.399	2.488													
	Sum Shields															21.024	5.596	9.952													
	Overall shield on harness bundles (Manganin-Braid)			1							1	braided shield 10 mm diam.	Mng	1.512																	
	Overall shield on harness bundles (Manganin-Braid)			1							1	braided shield 10 mm diam.	Mng	1.512																	
	Overall shield on harness bundles (Manganin-Braid)			1							1	braided shield 15 mm diam.	Mng	1.872																	
	Overall shield on harness bundles (Manganin-Braid)			1							1	braided shield 15 mm diam.	Mng	1.872																	
	Overall shield on harness bundles (Manganin-Braid)			1							1	braided shield 15 mm diam.	Mng	1.872																	
	Sum Shields															8.64															
	Sum Bundles 01-05 & COAX & Shields															16.3	6.014	131												15.92345	47.77034

HERSCHEL Cryo-Harness SVM-CB to LOU
(Cables Shields of CU Lines of Manganin)

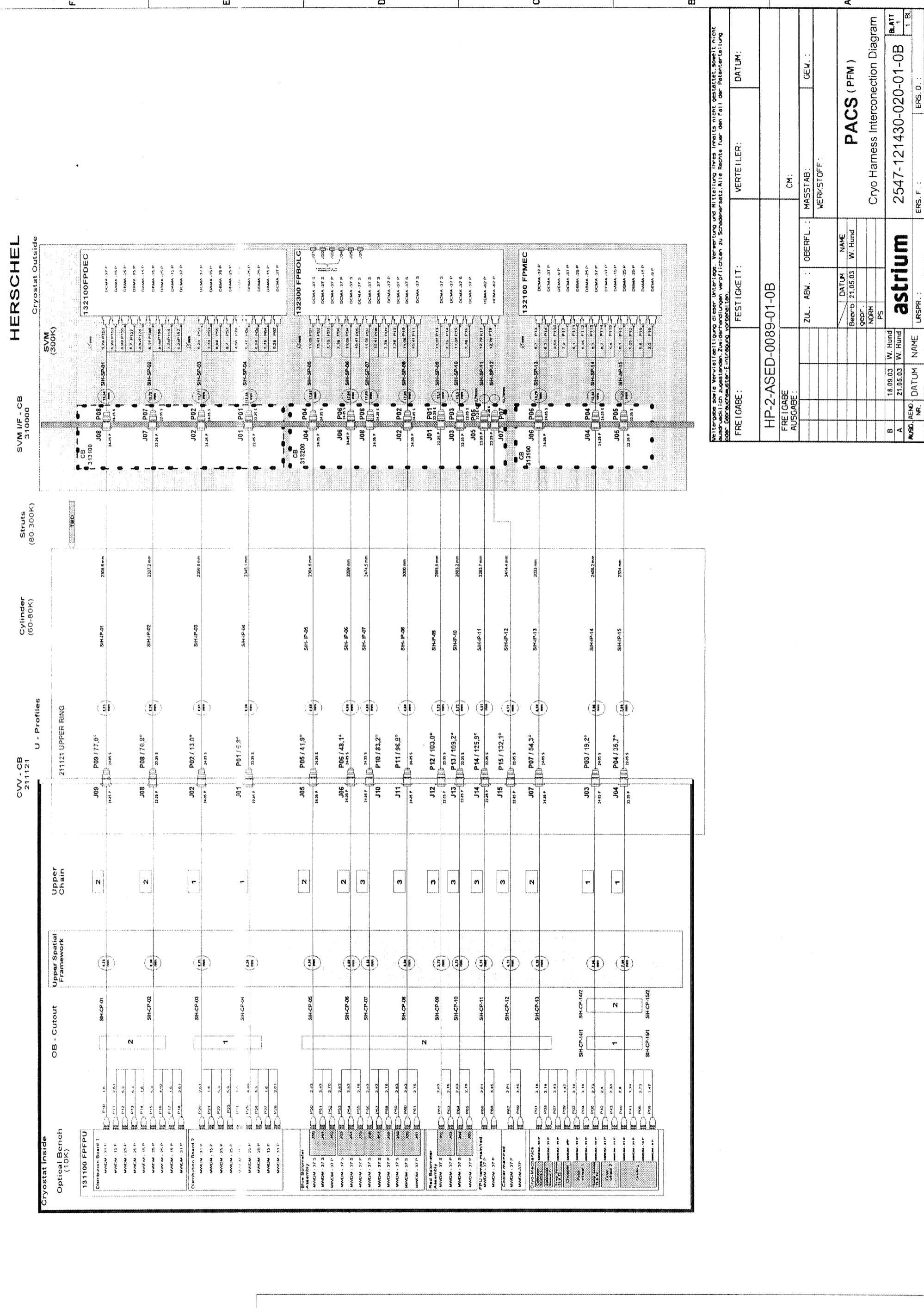
16,2,5	Description	Unit	Connector	no_of_wires	no_of_shd's	Bundle_No_SIH-IH-xx	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (LOU)	no_of_cables	cabl_e_type	condu.	R_core Ohm/m at 300 K	R_core Ohm/m at Op. Temp.	CU mm ²	SST mm ²	Brass mm ²	Manganin mm ²	Insulation mm ²	ext.Harness lth (m) from SVM-CB to LOU	ext.Harness R_ (Ohm) at 300 K from SVM-CB to LOU	SVM Int.Harness lth (m) from SVM-CB to LCU	SVM Int.Harness R_ (Ohm) at 300 K from SVM-CB to LCU	Rmax (Ohm) at 300 K from LCU to LOU	delta R (Ohm)	P_ei LOU on (W/m) at Op. Temperature
	LOA-1A-D1/D2	LOU	P01	12	2		0.05	1.2E+00	0.025	2	TS-06CC22	CU	0.016	0.011	4.800		1.234	0.896	2.389	0.604417	2.00	0.51	1.11	0.110	4.75E+00	
	LOA-1A-G1/G2	LOU	P01	4	1		1	1.0E-01	0.025	1	TS-04CC28	CU	0.253	0.253	0.36	0.264	0.952	2.389	2.389	0.604417	2.00	0.51	1.11	0.110	4.75E+00	
	LOA-1A-D1S/D2S-G1S/G2S	LOU	P01	8	1		400	1.0E-06	0.025	1	H08138	SST	140	140		0.166	1.323	2.389	2.389	334.46	2.00	0.51	334.97	-65.034	2.53E-01	
	LOA-1A-TVP/TVN	LOU	P01	2	1		400	1.0E-06	0.070	1	H04138(2)	SST	140	140	0.016	0.086	0.086	2.389	2.389	334.46	2.00	0.51	334.97	-65.034	2.80E-08	
	LOA-1A-TIP/TIN	LOU	P01	2	1		400	1.0E-03	0.070	1	H04138(2)	SST	140	140	0.098	0.876	0.876	2.389	2.389	334.46	2.00	0.51	334.97	-65.034	1.96E-02	
	LOA-1A-PL	LOU	P01	2	1		1	2.5E-01	0.025	1	TS-2CC28	CU	0.253	0.253	0.18	0.225	0.375	2.389	2.389	0.604417	2.00	0.51	1.11	0.110	7.91E-01	
	LOA-1A-1M/2M	LOU	P01	4	1		50	1.0E-02	0.025	1	H04138	BRASS	12	12	0.09	1.24	0.09	2.389	2.389	28.668	2.00	0.51	29.17	-20.826	1.20E-01	
	LOA-1A-1MS/2MS	LOU	P01	4	1		400	1.0E-05	0.025	1	H04138	SST	140	140	0.114	0.962	0.114	2.389	2.389	334.46	2.00	0.51	334.97	-65.034	1.40E-06	
	LOA-2A-D1/D2	LOU	P03	12	2	06	0.05	1.2E+00	0.025	2	TS-06CC22	CU	0.016	0.011	4.800		1.234	0.896	2.389		2.00	2.00	0.00		4.75E+00	
	LOA-2A-G1/G2	LOU	P03	4	1		1	1.0E-01	0.025	1	TS-04CC28	CU	0.253	0.253	0.36	0.264	0.952	2.389	2.389	0.604417	2.00	0.51	1.11	0.110	2.53E-01	
	LOA-2A-D1S/D2S-G1S/G2S	LOU	P03	8	1		400	1.0E-06	0.025	1	H08138	SST	140	140	0.166	1.323	2.389	2.389	334.46	2.00	0.51	334.97	-65.034	2.80E-08		
	LOA-2A-TVP/TVN	LOU	P03	2	1		400	1.0E-06	0.070	1	H04138(2)	SST	140	140	0.016	0.086	0.086	2.389	2.389	334.46	2.00	0.51	334.97	-65.034	1.96E-08	
	LOA-2A-TIP/TIN	LOU	P03	2	1		400	1.0E-03	0.070	1	H04138(2)	SST	140	140	0.098	0.876	0.876	2.389	2.389	334.46	2.00	0.51	334.97	-65.034	1.96E-02	
	LOA-2A-PL	LOU	P03	2	1		1	2.5E-01	0.025	1	TS-2CC28	CU	0.253	0.253	0.18	0.225	0.375	2.389	2.389	0.604417	2.00	0.51	1.11	0.110	7.91E-01	
	LOA-2A-1M/2M	LOU	P03	6	1		50	1.0E-02	0.025	1	H06138	BRASS	12	12	0.088	1.422	0.088	2.389	2.389	28.668	2.00	0.51	29.17	-20.826	1.80E-01	
	LOA-2A-1MS/2MS	LOU	P03	6	1		400	1.0E-05	0.025	1	H06138	SST	140	140	0.144	1.224	0.144	2.389	2.389	334.46	2.00	0.51	334.97	-65.034	2.10E-06	
	LOA-3A-D1/D2	LOU	P05	12	2		0.05	1.2E+00	0.025	2	TS-06CC22	CU	0.016	0.011	4.800		1.234	0.896	2.396		2.00	2.00			4.75E+00	
	LOA-3A-G1/G2	LOU	P05	4	1		1	1.0E-01	0.025	1	TS-04CC28	CU	0.253	0.253	0.36	0.264	0.952	2.396	2.396	0.606188	2.00	0.51	1.11	0.112	2.53E-01	
	LOA-3A-D1S/D2S-G1S/G2S	LOU	P05	8	1		400	1.0E-06	0.025	1	H08138	SST	140	140	0.166	1.323	2.396	2.396	335.44	2.00	0.51	335.95	-64.054	2.80E-08		
	LOA-3A-TVP/TVN	LOU	P05	2	1		400	1.0E-06	0.070	1	H04138(2)	SST	140	140	0.016	0.086	0.086	2.396	2.396	335.44	2.00	0.51	335.95	-64.054	1.96E-08	
	LOA-3A-TIP/TIN	LOU	P05	2	1		400	1.0E-03	0.070	1	H04138(2)	SST	140	140	0.098	0.876	0.876	2.396	2.396	335.44	2.00	0.51	335.95	-64.054	1.96E-02	
	LOA-3A-PL	LOU	P05	2	1		1	2.5E-01	0.025	1	TS-2CC28	CU	0.253	0.253	0.18	0.225	0.375	2.396	2.396	0.606188	2.00	0.51	1.11	0.112	7.91E-01	
	LOA-3A-1M/2M	LOU	P05	6	1		50	1.0E-02	0.025	1	H06138	BRASS	12	12	0.088	1.422	0.088	2.396	2.396	28.752	2.00	0.51	29.26	-20.742	1.80E-01	
	LOA-3A-1MS/2MS	LOU	P05	6	1		400	1.0E-05	0.025	1	H06138	SST	140	140	0.144	1.224	0.144	2.396	2.396	335.44	2.00	0.51	335.95	-64.054	2.10E-06	
	LOA-4A-D1/D2	LOU	P07	12	2	07	0.05	1.2E+00	0.025	2	TS-06CC22	CU	0.016	0.011	4.800		1.234	0.896	2.396		2.00	2.00			4.75E+00	
	LOA-4A-G1/G2	LOU	P07	4	1		1	1.0E-01	0.025	1	TS-04CC28	CU	0.253	0.253	0.36	0.264	0.952	2.396	2.396	0.606188	2.00	0.51	1.11	0.112	2.53E-01	
	LOA-4A-D1S/D2S-G1S/G2S	LOU	P07	8	1		400	1.0E-06	0.025	1	H08138	SST	140	140	0.166	1.323	2.396	2.396	335.44	2.00	0.51	335.95	-64.054	2.80E-08		
	LOA-4A-TVP/TVN	LOU	P07	2	1		400	1.0E-06	0.070	1	H04138(2)	SST	140	140	0.016	0.086	0.086	2.396	2.396	335.44	2.00	0.51	335.95	-64.054	1.96E-08	
	LOA-4A-TIP/TIN	LOU	P07	2	1		400	1.0E-03	0.070	1	H04138(2)	SST	140	140	0.098	0.876	0.876	2.396	2.396	335.44	2.00	0.51	335.95	-64.054	1.96E-02	
	LOA-4A-PL	LOU	P07	2	1		1	2.5E-01	0.025	1	TS-2CC28	CU	0.253	0.253	0.18	0.225	0.375	2.396	2.396	0.606188	2.00	0.51	1.11	0.112	7.91E-01	
	LOA-4A-1M/2M	LOU	P07	6	1		50	1.0E-02	0.025	1	H06138	BRASS	12	12	0.088	1.422	0.088	2.396	2.396	28.752	2.00	0.51	29.26	-20.742	1.80E-01	
	LOA-4A-1MS/2MS	LOU	P07	6	1		400	1.0E-05	0.025	1	H06138	SST	140	140	0.144	1.224	0.144	2.396	2.396	335.44	2.00	0.51	335.95	-64.054	2.10E-06	
	LOA-5A-D1/D2	LOU	P09	12	2		0.05	1.2E+00	0.025	2	TS-06CC22	CU	0.016	0.011	4.800		1.234	0.896	2.397		2.00	2.00			4.75E+00	
	LOA-5A-G1/G2	LOU	P09	4	1		1	1.0E-01	0.025	1	TS-04CC28	CU	0.253	0.253	0.36	0.264	0.952	2.397	2.397	0.606441	2.00	0.51	1.11	0.112	2.53E-01	
	LOA-5A-D1S/D2S-G1S/G2S	LOU	P09	8	1		400	1.0E-06	0.025	1	H08138	SST	140	140	0.166	1.323	2.397	2.397	335.58	2.00	0.51	336.09	-63.914	2.80E-08		
	LOA-5A-TVP/TVN	LOU	P09	2	1		400	1.0E-06	0.070	1	H04138(2)	SST	140	140	0.016	0.086	0.086	2.397	2.397	335.58	2.00	0.51	336.09	-63.914	1.96E-08	
	LOA-5A-TIP/TIN	LOU	P09	2	1		400	1.0E-03	0.070	1	H04138(2)	SST	140	140	0.098	0.876	0.876	2.397	2.397	335.58	2.00	0.51	336.09	-63.914	1.96E-02	
	LOA-5A-PL	LOU	P09	2	1		1	2.5E-01	0.025	1	TS-2CC28	CU	0.253	0.253	0.18	0.225	0.375	2.397	2.397	0.606441	2.00	0.51	1.11	0.112	7.91E-01	
	LOA-5A-1M/2M	LOU	P09	6	1		50	1.0E-02	0.025	1	H06138	BRASS	12	12	0.088	1.422	0.088	2.397	2.397	28.764	2.00	0.51	29.27	-20.730	1.80E-01	
	LOA-5A-1MS/2MS	LOU	P09	6	1		400	1.0E-05	0.025	1	H06138	SST	140	140	0.144	1.224	0.144	2.397	2.397	335.58	2.00	0.51	336.09	-63.914	2.10E-06	
	LOA-6A-D1/D2	LOU	P11	12	2	08	0.05	1.2E+00	0.025	2	TS-06CC22	CU	0.016	0.011	4.800		1.234	0.896	2.397		2.00	2.00			4.75E+00	
	LOA-6A-G1/G2	LOU	P11	4	1		1	1.0E-01	0.025	1	TS-04CC28	CU	0.253	0.253	0.36	0.264	0.952	2.397	2.397	0.606441	2.00	0.51	1.11	0.112	2.53E-01	
	LOA-6A-D1S/D2S-G1S/G2S	LOU	P11	8	1		400	1.0E-06	0.025	1	H08138	SST	140	140	0.166	1.323	2.397	2.397	335.58	2.00	0.51	336.09	-63.914	2.80E-08		
	LOA-6A-TVP/TVN	LOU	P11	2	1		400	1.0E-06	0.070	1	H04138(2)	SST	140	140	0.016	0.086	0.086	2.397	2.397	335.58	2.00	0.51	336.09	-63.914	1.96E-08	
	LOA-6A-TIP/TIN	LOU	P11	2	1		400	1.0E-03	0.070	1	H04138(2)	SST	140	140	0.098	0.876	0.876	2.397	2.397	335.58	2.00	0.51	336.09	-63.914	1.96E-02	
	LOA-6A-PL	LOU	P11	2	1		1	2.5E-01	0.025	1	TS-2															

HERSCHEL Cryo-Harness SVM-CB to LOU
(Cables Shields of CU Lines of Manganin)

Description	Unit	Connector	no_of_wires	no_of_shd's	Bundle_No._SIH-IH-xx	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (LOU)	no_of_cables	condu.	R_core Ohm/m at 300 K	R_core Ohm/m at Op. Temp.	CU mm ²	SST mm ²	Brass mm ²	Manganin mm ²	Insulation mm ²	ext.Harness lth (m) from SVM-CB to LOU	ext.Harness R_(Ohm) at 300 K from SVM-CB to LOU	SVM int.Harness lth (m) from SVM-CB to LCU	SVM int.Harness R_(Ohm) at 300 K from SVM-CB to LCU	LOU Harness Rmax (Ohm) at 300 K from LCU to LOU	delta R (Ohm)	P_eI LOU on (W/m) at Op. Temperature
16'2,5	LOU	P13	2	1	09	400	1.0E-06	0.070	1	SST	140	140		0.016			0.086	2.234	312.76	2.00	0.51	313.27	-86.734	1.96E-08
	LOU	P13	2			400	1.0E-03	0.070		SST	140	140		0.098			0.876	2.234	312.76	2.00	0.51	313.27	-86.734	1.96E-02
	LOU	P13	2	1		1	2.5E-01	0.025	1	CU	0.253	0.253	0.18			0.225	0.375	2.234	0.565202	2.00	0.51	1.07	0.071	7.91E-01
	LOU	P13	10	1		50	1.0E-02	0.025	1	BRASS	12	12		0.13	0.09		1.898	2.234	26.808	2.00	0.51	27.31	-22.686	3.00E-01
	LOU	P13	10	1		400	1.0E-05	0.025	1	SST	140	140		0.218			1.898	2.234	312.76	2.00	0.51	313.27	-86.734	3.50E-06
	LOU	P14	12	2		0.05	1.2E+00	0.025	2	CU	0.016	0.011	4.800			1.234	0.896	2.234		2.00			0.071	4.75E+00
	LOU	P14	4	1		1	1.0E-01	0.025	1	CU	0.253	0.253	0.36			0.264	0.952	2.234	0.565202	2.00	0.51	1.07	0.065	2.53E-01
	LOU	P14	8	1		400	1.0E-06	0.025	1	SST	140	140		0.166			1.323	2.234	312.76	2.00	0.51	313.27	-86.734	2.80E-08
	LOU	P14	2	1		400	1.0E-06	0.070	1	SST	140	140		0.016			0.086	2.234	312.76	2.00	0.51	313.27	-86.734	1.96E-08
	LOU	P14	2	1		400	1.0E-03	0.070	1	SST	140	140		0.098		0.225	0.375	2.234	0.565202	2.00	0.51	1.07	0.071	7.91E-01
	LOU	P14	2	1		1	2.5E-01	0.025	1	CU	0.253	0.253	0.18				1.898	2.234	26.808	2.00	0.51	27.31	-22.686	3.00E-01
	LOU	P14	10	1		50	1.0E-02	0.025	1	BRASS	12	12		0.13	0.09		1.898	2.234	312.76	2.00	0.51	313.27	-86.734	3.50E-06
	LOU	P14	10	1		400	1.0E-05	0.025	1	SST	140	140		0.218			1.898	2.234	312.76	2.00	0.51	313.27	-86.734	3.50E-06
	LOU	P02	12	2		0.05	1.2E+00	0.025	2	CU	0.016	0.011	4.800			1.234	0.896	2.21		2.00			0.065	4.75E+00
	LOU	P02	4	1		1	1.0E-01	0.025	1	CU	0.253	0.253	0.36			0.264	0.952	2.21	0.55913	2.00	0.51	1.07	0.065	2.53E-01
	LOU	P02	8	1		400	1.0E-06	0.025	1	SST	140	140		0.166			1.323	2.21	309.4	2.00	0.51	309.91	-90.094	2.80E-08
	LOU	P02	2	1		400	1.0E-06	0.070	1	SST	140	140		0.016			0.086	2.21	309.4	2.00	0.51	309.91	-90.094	1.96E-08
	LOU	P02	2	1		400	1.0E-03	0.070	1	SST	140	140		0.098		0.225	0.375	2.21	0.55913	2.00	0.51	1.07	0.065	7.91E-01
	LOU	P02	2	1		1	2.5E-01	0.025	1	CU	0.253	0.253	0.18				1.898	2.21	26.52	2.00	0.51	27.03	-22.974	1.20E-01
	LOU	P02	4	1		50	1.0E-02	0.025	1	BRASS	12	12		0.13	0.09		1.898	2.21	309.4	2.00	0.51	309.91	-90.094	0.00E+00
	LOU	P02	4	1		400	1.0E-05	0.025	1	SST	140	140		0.218			1.898	2.21	309.4	2.00	0.51	309.91	-90.094	0.00E+00
	LOU	P04	12	2		0.05	1.2E+00	0.025	2	CU	0.016	0.011	4.800			1.234	0.896	2.21		2.00			0.065	4.75E+00
	LOU	P04	4	1		1	1.0E-01	0.025	1	CU	0.253	0.253	0.36			0.264	0.952	2.21	0.55913	2.00	0.51	1.07	0.065	2.53E-01
	LOU	P04	8	1		400	1.0E-06	0.025	1	SST	140	140		0.166			1.323	2.21	309.4	2.00	0.51	309.91	-90.094	2.80E-08
	LOU	P04	2	1		400	1.0E-06	0.070	1	SST	140	140		0.016			0.086	2.21	309.4	2.00	0.51	309.91	-90.094	1.96E-08
	LOU	P04	2	1		400	1.0E-03	0.070	1	SST	140	140		0.098		0.225	0.375	2.21	0.55913	2.00	0.51	1.07	0.065	7.91E-01
	LOU	P04	2	1		1	2.5E-01	0.025	1	CU	0.253	0.253	0.18				1.422	2.21	26.52	2.00	0.51	27.03	-22.974	1.80E-01
	LOU	P04	6	1		50	1.0E-02	0.025	1	BRASS	12	12		0.088	0.05		1.422	2.21	309.4	2.00	0.51	309.91	-90.094	2.10E-06
	LOU	P04	6	1		400	1.0E-05	0.025	1	SST	140	140		0.144			1.224	2.21	309.4	2.00	0.51	309.91	-90.094	2.10E-06
	LOU	P06	12	2		0.05	1.2E+00	0.025	2	CU	0.016	0.011	4.800			1.234	0.896	2.204		2.00			0.064	4.75E+00
	LOU	P06	4	1		1	1.0E-01	0.025	1	CU	0.253	0.253	0.36			0.264	0.952	2.204	0.557612	2.00	0.51	1.06	0.064	2.53E-01
	LOU	P06	8	1		400	1.0E-06	0.025	1	SST	140	140		0.166			1.323	2.204	308.56	2.00	0.51	309.07	-90.934	2.80E-08
	LOU	P06	2	1		400	1.0E-06	0.070	1	SST	140	140		0.016			0.086	2.204	308.56	2.00	0.51	309.07	-90.934	1.96E-08
	LOU	P06	2	1		400	1.0E-03	0.070	1	SST	140	140		0.098		0.225	0.375	2.204	0.557612	2.00	0.51	1.06	0.064	7.91E-01
	LOU	P06	2	1		1	2.5E-01	0.025	1	CU	0.253	0.253	0.18				1.422	2.204	26.448	2.00	0.51	26.95	-23.046	1.80E-01
	LOU	P06	6	1		50	1.0E-02	0.025	1	BRASS	12	12		0.088	0.05		1.422	2.204	308.56	2.00	0.51	309.07	-90.934	2.10E-06
	LOU	P06	6	1		400	1.0E-05	0.025	1	SST	140	140		0.144			1.224	2.204	308.56	2.00	0.51	309.07	-90.934	2.10E-06
	LOU	P08	12	2		0.05	1.2E+00	0.025	2	CU	0.016	0.011	4.800			1.234	0.896	2.204		2.00			0.064	4.75E+00
	LOU	P08	4	1		1	1.0E-01	0.025	1	CU	0.253	0.253	0.36			0.264	0.952	2.204	0.557612	2.00	0.51	1.06	0.064	2.53E-01
	LOU	P08	8	1		400	1.0E-06	0.025	1	SST	140	140		0.166			1.323	2.204	308.56	2.00	0.51	309.07	-90.934	2.80E-08
	LOU	P08	2	1		400	1.0E-06	0.070	1	SST	140	140		0.016			0.086	2.204	308.56	2.00	0.51	309.07	-90.934	1.96E-08
	LOU	P08	2	1		400	1.0E-03	0.070	1	SST	140	140		0.098		0.225	0.375	2.204	0.557612	2.00	0.51	1.06	0.064	7.91E-01
	LOU	P08	2	1		1	2.5E-01	0.025	1	CU	0.253	0.253	0.18				1.422	2.204	26.448	2.00	0.51	26.95	-23.046	1.80E-01
	LOU	P08	6	1		50	1.0E-02	0.025	1	BRASS	12	12		0.088	0.05		1.422	2.204	308.56	2.00	0.51	309.07	-90.934	2.10E-06
	LOU	P08	6	1		400	1.0E-05	0.025	1	SST	140	140		0.144			1.224	2.204	308.56	2.00	0.51	309.07	-90.934	2.10E-06
	LOU	P10	12	2		0.05	1.2E+00	0.025	2	CU	0.016	0.011	4.800			1.234	0.896	2.167		2.00			0.054	4.75E+00
	LOU	P10	4	1		1	1.0E-01	0.025	1	CU	0.253	0.253	0.36			0.264	0.952	2.167	0.548251	2.00	0.51	1.05	0.054	2.53E-01

HERSCHEL Cryo-Harness SVM-CB to LOU
(Cables Shields of CU Lines of Manganin)

16,2,5	Description	Unit	Connector	no_of_wires	no_of_shd's	Bundle_No_SIH-IH-xx	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (LOU)	no_of_cables	cabl_type	condu.	R_core Ohm/m at 300 K	R_core Ohm/m at Op. Temp.	CU mm²	SST mm²	Brass mm²	Manganin mm²	Insulation mm²	ext.Harness lth (m) from SVM-CB to LOU	ext.Harness R_(Ohm) at 300 K from SVM-CB to LOU	SVM int.Harness lth (m) from SVM-CB to LCU	R_(Ohm) at 300 K from SVM-CB to LCU	LOU Harness Rmax_(Ohm) at 300 K from LCU to LOU	delta R (Ohm)	P_eI LOU on (mW/m) at Op. Temperature
	LOA-5B-D1S/D2S-G1S/G2S	LOU	P10	8	1		400	1.0E-06	0.025	1	H08138	SST	140	140		0.166			1.323	2.167	303.38	2.00	0.51	303.89	-96.114	2.80E-08
	LOA-5B-TVP/TVN	LOU	P10	2	1		400	1.0E-06	0.070	1	H04138(2)	SST	140	140		0.016			0.086	2.167	303.38	2.00	0.51	303.89	-96.114	1.96E-08
	LOA-5B-TIP/TIN	LOU	P10	2			400	1.0E-03	0.070		H04138(2)	SST	140	140		0.098			0.876	2.167	303.38	2.00	0.51	303.89	-96.114	1.96E-02
	LOA-5B-PL	LOU	P10	2	1		1	2.5E-01	0.025	1	TS-2CC28	CU	0.253	0.253	0.18			0.225	0.375	2.167	0.548251	2.00	0.51	1.05	0.054	7.91E-01
	LOA-5B-1M/2M	LOU	P10	6	1		50	1.0E-02	0.025	1	H06138	BRASS	12	12		0.088	0.05		1.422	2.167	26.004	2.00	0.51	26.51	-23.490	1.80E-01
	LOA-5B-1MS/2MS/3MS	LOU	P10	6	1		400	1.0E-05	0.025	1	H06138	SST	140	140		0.144			1.224	2.167	303.38	2.00	0.51	303.89	-96.114	2.10E-06
	LOA-6B-D1/D2	LOU	P12	12	2	12	0.05	1.2E+00	0.025	2	TS-06CC22	CU	0.016	0.011	4.800			1.234	0.896	2.167	2.00					
	LOA-6B-G1/G2	LOU	P12	4	1		1	1.0E-01	0.025	1	TS-04CC28	CU	0.253	0.253	0.36			0.264	0.952	2.167	0.548251	2.00	0.51	1.05	0.054	2.53E-01
	LOA-6B-D1S/D2S-G1S/G2S	LOU	P12	8	1		400	1.0E-06	0.025	1	H08138	SST	140	140		0.166			1.323	2.167	303.38	2.00	0.51	303.89	-96.114	2.80E-08
	LOA-6B-TVP/TVN	LOU	P12	2	1		400	1.0E-06	0.070	1	H04138(2)	SST	140	140		0.016			0.086	2.167	303.38	2.00	0.51	303.89	-96.114	1.96E-08
	LOA-6B-TIP/TIN	LOU	P12	2			400	1.0E-03	0.070		H04138(2)	SST	140	140		0.098			0.876	2.167	303.38	2.00	0.51	303.89	-96.114	1.96E-02
	LOA-6B-PL	LOU	P12	2	1		1	2.5E-01	0.025	1	TS-2CC28	CU	0.253	0.253	0.18			0.225	0.375	2.167	0.548251	2.00	0.51	1.05	0.054	7.91E-01
	LOA-6B-1M/2M	LOU	P12	10	1		50	1.0E-02	0.025	1	H11138	BRASS	12	12		0.13	0.09		1.898	2.167	26.004	2.00	0.51	26.51	-23.490	3.00E-01
	LOA-6B-1MS-5MS	LOU	P12	10	1		400	1.0E-05	0.025	1	H11138	SST	140	140		0.218			1.898	2.167	303.38	2.00	0.51	303.89	-96.114	3.50E-06
	HEAT - R	LOU	P16	2	1		1	1.5E-01	0.000	1	TS-2CC28	CU	0.253	0.141	0.18			0.225	0.375	2.167	0.305547	2.00	0.28	0.59	-0.412	0.00E+00
	Sum:														75.120	7.720	0.914	24.308	106.212							85.89



HERSCHEL
Cryostat Outside

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VERTEILER:	FESTIGKEIT:	DATE:	MATERIAL:
VERTEILER:	DATE:	MATERIAL:	GEW.:

PACS (PFM)
Cryo Harness Interconnection Diagram

astrium

2547-121430-020-01-0B
 ERS. F.: _____ ERS. D.: _____

Cable_ID	Description	Unit	Connector	no_of_wires	no_of_shd's	Bundle_No_SIH-CP-....	U-Profile-No.	Strut-No.	R_max_core (Ohm) at 300 K	Cable				CVV ext. Harness SVM-CB to CVV I/F-CB				Harness total				P_ei avg [mW/m]	P_ei Spec on (mW/m)	P_ei Phot on (mW/m)					
										Duty_Cycle (T +)	I_nominal (A)	condu.	no_of_cables	no_of_shd's	Insulation mm ²	Brass mm ²	SST mm ²	Manganin mm ²	R_max (Ohm)	Harness lth (m)	R_core (Ohm/m) at 300 K				Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K	delta R (Ohm)
606b	8 tw pairs shielded, SST, B2, Out+I_sens	FPFPU	P53	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	2.726	309.67	8.354	581.88	218.12	1.21E-04	7.27E-04	
606c	8 tw pairs shielded, SST, B2, Out+T_sens	FPFPU	P53	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	2.726	309.67	8.354	581.88	218.12	1.21E-04	7.27E-04	
607b	8 tw pairs shielded, SST, B2, Out+T_sens	FPFPU	P54	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	2.726	309.67	8.327	578.82	221.18	1.21E-04	7.27E-04	
607c	8 tw pairs shielded, SST, B2, Out+T_sens	FPFPU	P54	16	1	06	2400		800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	2.726	309.67	8.327	578.82	221.18	1.21E-04	7.27E-04	
608	Shielded cable, SST, bias Bol B_2	FPFPU	P55	18	1				800	1.00E-05	0.1667	1	H19138	SST				2.145	0	2.145	113.6	2.726	309.67	8.313	577.23	222.77	3.41E-05	2.05E-04	
609	Shielded cable, SST, Clocks low level Bol B_2	FPFPU	P55	3	1				800	5.00E-05	0.1667	1	H03138	SST				0.856	0	0.856	113.6	2.726	309.67	8.313	577.23	222.77	1.42E-04	8.52E-04	
610	Shielded cable, SST, Clocks high level Bol	FPFPU	P55	10	1				800	5.00E-05	0.1667	1	H11138	SST				1.898	0	1.898	113.6	2.726	309.67	8.313	577.23	222.77	4.73E-04	2.84E-03	
608b	Shielded cable, Brass, Bol B2	FPFPU	P55	2	1				80	3.00E-04	0.3333	1	H02130BS	Brass				1.34	0	1.34	1.4	2.726	3.82	8.313	7.9231	72.08	8.40E-05	5.04E-04	
	Sum Bundle 06																	1.876	0.102	15.715							1.22E-03	0.00E+00	7.31E-03
611b	8 tw pairs shielded, SST, B3, Out+T_sens	FPFPU	P56	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.011	342.05	7.784	552.27	247.73	1.21E-04	7.27E-04	
611c	8 tw pairs shielded, SST, B3, Out+T_sens	FPFPU	P56	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.011	342.05	7.784	552.27	247.73	1.21E-04	7.27E-04	
612b	8 tw pairs shielded, SST, B3, Out+T_sens	FPFPU	P57	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.011	342.05	7.799	553.97	246.03	1.21E-04	7.27E-04	
612c	8 tw pairs shielded, SST, B3, Out+T_sens	FPFPU	P57	16	1	07	2526		800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.011	342.05	7.799	553.97	246.03	1.21E-04	7.27E-04	
613	Shielded cable, SST, bias Bol B_3	FPFPU	P58	18	1				800	1.00E-05	0.1667	1	H19138	SST				2.145	0	2.145	113.6	3.011	342.05	7.822	556.59	243.41	3.41E-05	2.05E-04	
614	Shielded cable, SST, Clocks low level Bol B_3	FPFPU	P58	3	1				800	5.00E-05	0.1667	1	H03138	SST				0.856	0	0.856	113.6	3.011	342.05	7.822	556.59	243.41	1.42E-04	8.52E-04	
615	Shielded cable, SST, Clocks high level Bol	FPFPU	P58	10	1				800	5.00E-05	0.1667	1	H11138	SST				1.898	0	1.898	113.6	3.011	342.05	7.822	556.59	243.41	4.73E-04	2.84E-03	
613b	Shielded cable, Brass, Bol B3	FPFPU	P58	2	1				80	3.00E-04	0.3333	1	H02130	Brass				1.34	0	1.34	1.4	2.726	4.22	7.822	7.5912	72.41	8.40E-05	5.04E-04	
	Sum Bundle 07																	1.902	0.102	15.715							1.22E-03	0.00E+00	7.31E-03
616b	8 tw pairs shielded, SST, B4, Out+T_sens	FPFPU	P59	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.392	385.33	8.285	576.31	223.69	1.21E-04	7.27E-04	
616c	8 tw pairs shielded, SST, B4, Out+T_sens	FPFPU	P59	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.392	385.33	8.285	576.31	223.69	1.21E-04	7.27E-04	
617b	8 tw pairs shielded, SST, B4, Out+T_sens	FPFPU	P60	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.392	385.33	8.261	573.59	226.41	1.21E-04	7.27E-04	
617c	8 tw pairs shielded, SST, B4, Out+T_sens	FPFPU	P60	16	1	08	2728		800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.392	385.33	8.261	573.59	226.41	1.21E-04	7.27E-04	
618	Shielded cable, SST, bias Bol B_4	FPFPU	P61	18	1				800	1.00E-05	0.1667	1	H19138	SST				2.145	0	2.145	113.6	3.392	385.33	8.244	571.65	228.35	3.41E-05	2.05E-04	
619	Shielded cable, SST, Clocks low level Bol B_4	FPFPU	P61	3	1				800	5.00E-05	0.1667	1	H03138	SST				0.856	0	0.856	113.6	3.392	385.33	8.244	571.65	228.35	1.42E-04	8.52E-04	
620	Shielded cable, SST, Clocks high level Bol	FPFPU	P61	10	1				800	5.00E-05	0.1667	1	H11138	SST				1.898	0	1.898	113.6	3.392	385.33	8.244	571.65	228.35	4.73E-04	2.84E-03	
618b	Shielded cable, Brass, Bol B4	FPFPU	P61	2	1				80	3.00E-04	0.3333	1	H02130	Brass				1.34	0	1.34	1.4	2.726	4.75	8.244	7.8494	72.15	8.40E-05	5.04E-04	
	Sum Bundle 08																	1.902	0.102	15.715							1.22E-03	0.00E+00	7.31E-03
621b	8 tw pairs shielded, SST, R1, Out+T_sens	FPFPU	P62	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.349	380.45	8.239	559.07	240.93	1.21E-04	7.27E-04	
621c	8 tw pairs shielded, SST, R1, Out+T_sens	FPFPU	P62	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.349	380.45	8.239	559.07	240.93	1.21E-04	7.27E-04	
622	Shielded cable, SST, bias	FPFPU	P63	18	1	09	27		800	1.00E-05	0.1667	1	H19138	SST				2.145	0	2.145	113.6	3.349	380.45	8.224	557.37	242.63	3.41E-05	2.05E-04	
623	Shielded cable, SST, Clocks low level Bol R1	FPFPU	P63	3	1				800	5.00E-05	0.1667	1	H03138	SST				0.856	0	0.856	113.6	3.349	380.45	8.224	557.37	242.63	1.42E-04	8.52E-04	
624	Shielded cable, SST, Clocks high level Bol R1	FPFPU	P63	10	1				800	5.00E-05	0.1667	1	H11138	SST				1.898	0	1.898	113.6	3.349	380.45	8.224	557.37	242.63	4.73E-04	2.84E-03	
622b	Shielded cable, Brass, Bol R1	FPFPU	P63	2	1				80	3.00E-04	0.3333	1	H02130	Brass				1.34	0	1.34	1.4	2.726	4.69	8.224	7.8998	72.30	8.40E-05	5.04E-04	
	Sum Bundle 09																	1.306	0.102	10.977							9.76E-04	0.00E+00	5.86E-03
625b	8 tw pairs shielded, SST, R2, Out+T_sens	FPFPU	P64	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.299	374.77	8.086	540.78	259.22	1.21E-04	7.27E-04	
625c	8 tw pairs shielded, SST, R2, Out+T_sens	FPFPU	P64	16	1				800	2.00E-05	0.1667	1	H08-02138	SST				2.369	0	2.369	113.6	3.299	374.77	8.086	540.78	259.22	1.21E-04	7.27E-04	
626	Shielded cable, SST, bias	FPFPU	P65	18	1	10	2728		800	1.00E-05	0.1667	1	H19138	SST				2.145	0	2.145	113.6	3.299	374.77	8.11	543.51	256.49	3.41E-05	2.05E-04	
627	Shielded cable, SST, Clocks low level Bol R2	FPFPU	P65	3	1				800	5.00E-05	0.1667	1	H03138	SST				0.856	0	0.856	113.6	3.299	374.77	8.11	543.51	256.49	1.42E-04	8.52E-04	
628	Shielded cable, SST, Clocks high level Bol R2	FPFPU	P65	10	1				800	5.00E-05	0.1667	1	H11138	SST				1.898	0	1.898	113.6	3.299	374.77	8.11	543.51	256.49	4.73E-04	2.84E-03	
626b	Shielded cable, Brass, Bol R2	FPFPU	P65	2	1				80	3.00E-04	0.3333	1	H02130	Brass				1.34	0	1.34	1.4	2.726	4.62	8.11	7.531	72.47	8.40E-05	5.04E-04	
	Sum Bundle 10																	1.306	0.102	10.977							9.76E-04	0.00E+00	5.86E-03
629	2 tw.pairs, shielded, SST, Bol SP_Temp	FPFPU	P68	4	1				800	1.00E-06	0.0300	1	H02-02138	SST				1.299	0	1.299	113.6	3.734	424.18	8.504	585.66	214.34	1.36E-08	8.18E-08	
630	2 tw.pairs, shielded, SST, Bol EV_Temp	FPFPU	P68	4	1				800	1.00E-06	0.0300	1	H02-02138	SST				1.2											

Cable_ID	Description	Unit	Connector	no_of_wires	no_of_shds	Bundle_No_SIH-CP-....	U-Profile-No.	Strut-No.	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (T%)	no_of_cables	Cable						Insulation mm²	CVW ext. Harness SVM-CB to CVW I/F-CB			Harness total			P_el, avg [mW/m]	P_el Spec on (mW/m)	P_el Phot on (mW/m)		
													condu.	no_of_cables	no_of_cables	no_of_cables	Manganin mm²	SST mm²		Brass mm²	Insulation mm²	R_core (Ohm/m) at 300 K	Harness lth (m)	R_max (Ohm)	Harness lth (m)				R_max (Ohm)	delta R (Ohm)
634	6 tw.pairs, shielded, Brass, Cooler Ts/Heater	FPPFU P68	P68	12	1				8	2.50E-02	0.0170	1	H06-02130	BRASS		0.274	0.612	5.024	1.4	3.734	5.23	8.504	6.0767	1.92			1.79E-01		1.07E+00	
641	2 tw.pairs, shielded, SST, Bol 300mk_Temp	FPPFU P66	P66	4	1				800	1.00E+00	0.0300	1	H02-02138	SST		0.141	0	1.299	113.6	3.734	424.18	8.502	585.43	214.57			1.36E-08		8.18E-08	
642	2 tw.pairs, shielded, SST, Bol 300mk_Temp	FPPFU P66	P66	4	1				800	1.00E+00	0.0300	1	H02-02138	SST		0.141	0	1.299	113.6	3.734	424.18	8.502	585.43	214.57			1.36E-08		8.18E-08	
643	2 tw.pairs, shielded, SST, Bol FPU_Temp	FPPFU P66	P66	4	1				800	1.00E+00	0.0300	1	H02-02138	SST		0.141	0	1.299	113.6	3.734	424.18	8.502	585.43	214.57			1.36E-08		8.18E-08	
644	2 tw.pairs, shielded, SST, Bol FPU_heater	FPPFU P66	P66	4	1				8	2.00E-05	0.1667	1	H06-02130	BRASS		0.172	0.204	2.236	1.4	3.734	5.23	8.502	8.0535	-0.05			3.73E-07		2.24E-06	
Sum Bundle 11													1.574	0.816	17.652						1.79E-01	0.00E+00	1.07E+00							
635	2 tw.pairs, shielded, SST, Bol SP_Temp	FPPFU P69	P69	4	1				800	0.00E+00	0.0030	1	H02-02138	SST		0.141	0	1.299	113.6	3.899	442.93	8.596	603.14	196.86			0.00E+00		0.00E+00	
636	2 tw.pairs, shielded, SST, Bol EV_Temp	FPPFU P69	P69	4	1				800	0.00E+00	0.0300	1	H02-02138	SST		0.141	0	1.299	113.6	3.899	442.93	8.596	603.14	196.86			0.00E+00		0.00E+00	
637	2 tw.pairs, shielded, SST, Bol HSP_Temp	FPPFU P69	P69	4	1				800	0.00E+00	0.0300	1	H02-02138	SST		0.141	0	1.299	113.6	3.899	442.93	8.596	603.14	196.86			0.00E+00		0.00E+00	
638	2 tw.pairs, shielded, SST, Bol HSE_Temp	FPPFU P69	P69	4	1				800	0.00E+00	0.0300	1	H02-02138	SST		0.141	0	1.299	113.6	3.899	442.93	8.596	603.14	196.86			0.00E+00		0.00E+00	
639	2 tw.pairs, shielded, SST, Bol SHUNT_Temp	FPPFU P69	P69	4	1	12	2728	24	800	0.00E+00	0.0300	1	H02-02138	SST		0.141	0	1.299	113.6	3.899	442.93	8.596	603.14	196.86			0.00E+00		0.00E+00	
640	6 tw.pairs, shielded, Brass, Cooler Ts/Heater	FPPFU P69	P69	12	1				8	0.00E+00	0.0170	1	H06-02130	BRASS		0.274	0.612	5.024	1.4	3.899	5.46	8.596	8.2562	-0.26	2 lines in parallel			0.00E+00		0.00E+00
645	2 tw.pairs, shielded, SST, Bol 300mk_Temp	FPPFU P67	P67	4	1				800	0.00E+00	0.0000	1	H02-02138	SST		0.141	0	1.299	113.6	3.899	442.93	8.602	603.82	196.18			0.00E+00		0.00E+00	
646	2 tw.pairs, shielded, SST, Bol 300mk_Temp	FPPFU P67	P67	4	1				800	0.00E+00	0.0000	1	H02-02138	SST		0.141	0	1.299	113.6	3.899	442.93	8.602	603.82	196.18			0.00E+00		0.00E+00	
647	2 tw.pairs, shielded, SST, Bol FPU_Temp	FPPFU P67	P67	4	1				800	0.00E+00	0.0000	1	H02-02138	SST		0.141	0	1.299	113.6	3.899	442.93	8.602	603.82	196.18			0.00E+00		0.00E+00	
648	2 tw.pairs, shielded, SST, Bol FPU_heater	FPPFU P67	P67	4	1				8	0.00E+00	0.0000	1	H06-02130	BRASS		0.172	0.204	2.236	1.4	3.899	5.46	8.602	8.2646	-0.26			0.00E+00		0.00E+00	
Sum Bundle 12													1.574	0.816	17.652						0.00E+00	0.00E+00	0.00E+00							
077	Shielded cable, Brass, Fwheal1 drive	FPPFU P01	P01	4	1				8	2.50E-01	0.0030	1	H04130	BRASS		0.172	0.204	2.236	1.4	2.398	3.36	8.323	7.6297	0.37			1.05E+00		6.30E+00	
078	Shielded cable, SST, FW1 Hall Sens1	FPPFU P01	P01	4	1				800	1.00E-03	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.398	272.41	8.323	547.98	252.02			1.36E-03		8.18E-03	
079	Shielded cable, SST, FW1 Hall Sens2	FPPFU P01	P01	4	1				800	1.00E-03	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.398	272.41	8.323	547.98	252.02			1.36E-03		8.18E-03	
080	Shielded cable, SST, FW1 Pos Sens	FPPFU P01	P01	8	1				800	2.00E-03	0.0030	1	H04138	SST		0.166	0	1.323	113.6	2.398	272.41	8.323	547.98	252.02			1.09E-02		6.54E-02	
081	Shielded cable, SST, FW1 Temp Sens	FPPFU P01	P01	4	1				800	1.00E-04	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.398	272.41	8.323	547.98	252.02			1.36E-04		8.18E-04	
082	Shielded cable, Brass, Fwheal2 drive	FPPFU P03	P03	4	1				8	2.50E-01	0.0030	1	H08138(4)	SST		0.134	0	1.151	60	2.398	3.36	8.71	8.1715	-0.17	2 lines in parallel			1.05E+00		6.30E+00
088	Shielded cable, SST, FW2 Hall Sens1	FPPFU P03	P03	4	1				800	1.00E-03	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.398	272.41	8.71	591.95	208.05			1.36E-03		8.18E-03	
089	Shielded cable, SST, FW2 Hall Sens2	FPPFU P03	P03	4	1				800	1.00E-03	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.398	272.41	8.71	591.95	208.05			1.36E-03		8.18E-03	
090	Shielded cable, SST, FW2 Pos Sens	FPPFU P03	P03	8	1			24	800	2.00E-03	0.0030	1	H08138	SST		0.166	0	1.323	113.6	2.398	272.41	8.71	591.95	208.05			1.09E-02		6.54E-02	
091	Shielded cable, SST, FW2 Temp Sens	FPPFU P03	P03	4	1			2400	800	1.00E-04	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.398	272.41	8.71	591.95	208.05			1.36E-04		8.18E-04	
124	Shielded cable, SST, 2 FPU1 Sensors red.	FPPFU P09	P09	8	1				1000	0.00E+00	0.0000	1	H08138	SST		0.166	0	1.323	113.6	2.398	272.41	8.374	553.78	446.22			0.00E+00		0.00E+00	
113	Shielded cable, SST, Chip Pos Sens1	FPPFU P07	P07	4	1				400	5.00E-04	0.3333	1	H08138(4)	SST		0.032	0	0.172	60	2.398	143.88	8.571	304.73	95.27			2.00E-02		6.00E-02	
114	Shielded cable, SST, Chip Pos Sens2	FPPFU P07	P07	4	1				400	5.00E-04	0.3333	1	H08138(4)	SST		0.032	0	0.172	60	2.398	143.88	8.571	304.73	95.27			2.00E-02		6.00E-02	
115	Shielded cable, SST, Chip Pos Sens3	FPPFU P07	P07	4	1				400	5.00E-04	0.3333	1	H08138(4)	SST		0.032	0	0.172	60	2.398	143.88	8.571	304.73	95.27			2.00E-02		6.00E-02	
116	Shielded cable, Brass, Chopper drive	FPPFU P07	P07	4	1				8	1.20E-02	0.3333	1	H04130	BRASS		0.172	0.204	2.236	1.4	2.398	3.36	8.571	7.9769	0.02			2.69E-01		8.06E-01	
116a	Shielded cable, Brass, Chopper drive	FPPFU P07	P07	4	1				8	1.20E-02	0.3333	1	H04130	BRASS		0.172	0.204	2.236	1.4	2.398	3.36	8.571	7.9769	0.02			2.69E-01		8.06E-01	
Sum Bundle 13													2.316	0.816	22.293						2.71E+00	8.12E+00	8.12E+00							
082	Shielded cable, Brass, Fwheal1 drive	FPPFU P02	P02	4	1				8	0.00E+00	0.0030	1	H04130	BRASS		0.172	0.204	2.236	1.4	2.256	3.16	7.727	7.511	0.49			0.00E+00		0.00E+00	
083	Shielded cable, SST, FW1 Hall Sens	FPPFU P02	P02	4	1				800	0.00E+00	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.256	256.28	7.727	551.01	248.99			0.00E+00		0.00E+00	
084	Shielded cable, SST, FW1 Hall Sens	FPPFU P02	P02	4	1				800	0.00E+00	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.256	256.28	7.727	551.01	248.99			0.00E+00		0.00E+00	
085	Shielded cable, SST, FW1 Pos Sens	FPPFU P02	P02	8	1				800	0.00E+00	0.0030	1	H04138	SST		0.166	0	1.323	113.6	2.256	256.28	7.727	551.01	248.99			0.00E+00		0.00E+00	
086	Shielded cable, SST, FW1 Temp Sens	FPPFU P02	P02	4	1				800	0.00E+00	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.256	256.28	7.727	551.01	248.99			0.00E+00		0.00E+00	
092	Shielded cable, Brass, Fwheal2 drive	FPPFU P04	P04	4	1				8	0.00E+00	0.0030	1	H04130	BRASS		0.172	0.204	2.236	1.4	2.256	3.16	8.268	8.2684	-0.27	2 lines in parallel			0.00E+00		0.00E+00
093	Shielded cable, SST, FW2 Hall Sens1	FPPFU P04	P04	4	1				800	0.00E+00	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.256	256.28	8.268	612.47	187.53			0.00E+00		0.00E+00	
094	Shielded cable, SST, FW2 Hall Sens2	FPPFU P04	P04	4	1				800	0.00E+00	0.0030	1	H04138	SST		0.114	0	0.962	113.6	2.256	256.28	8.268	612.47	187.53			0.00E+00		0.00E+00	
095	Shield																													

Cable_ID	Designation	Description	Unit	Connector	no_of_wires	no_of_shds	Bundle_No. SIH-CP-....	Upper chain	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (T ⁻¹)	Cable						CVV int. Harness CVV I/F-CB to CEU's			Harness total			P_el avg [mW/m]	P_el Spec on (mW/m)	P_el Phot on (mW/m)											
												no_of_cables	no_of_shds	condu.	SST mm ²	Brass mm ²	Insulation mm ²	R_core (Ohm/m) at 300 K	Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K	delta R (Ohm)				REMARKS										
001	Shielded cable, CRE DC/logic supply 1		FPPU	P11	2				400	3.00E-05	0.1667								60	2.515	150.90	7.9	290.4	109.60				1.80E-05	1.08E-04								
001	Shielded cable, CRE DC/logic supply 1		FPPU	P11	8	1			800	1.00E-05	0.1667	1	H1138(2)	SST	0.016	0	0.086		113.6	2.515	285.70	7.9	549.12	250.88				1.51E-05	9.09E-05								
002	Shielded cable, CRE DC supply 1		FPPU	P10	6	6			400	3.00E-05	0.1667	1	H24138(6)	SST	0.048	0	0.258		60	2.524	151.44	7.909	290.94	109.06				5.40E-05	3.24E-04								
002	Shielded cable, CRE DC supply 1		FPPU	P10	16	1			800	1.00E-05	0.1667	1	H24138(16)	SST	0.316	0	2.599		113.6	2.524	286.73	7.909	550.15	249.85				3.03E-05	1.82E-04								
003	Shielded cable, Det. Bias supply 1		FPPU	P10	6	1			800	1.00E-05	0.1667	1	H06138	SST	0.144	0	1.224		113.6	2.524	286.73	7.909	550.15	249.85				1.14E-05	6.82E-05								
017	Triax cable, CRE-Out line group1 out_1		FPPU	P12	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.507	284.80	7.892	548.22	251.78				3.69E-07	2.22E-06								
018	Triax cable, CRE-Out line group1 out_2		FPPU	P12	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
019	Triax cable, CRE-Out line group1 out_3		FPPU	P12	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
020	Triax cable, CRE-Out line group1 out_4		FPPU	P12	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
021	Triax cable, CRE-Out line group1 out_5		FPPU	P12	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
022	Triax cable, CRE-Out line group1 out_6		FPPU	P12	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
023	Triax cable, CRE-Out line group1 out_7		FPPU	P12	1	2	01		800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
013a	Shielded cable, Outrefa_1		FPPU	P12	1	2			800	1.00E-04	0.1667	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	299.57	500.43				1.89E-04	1.14E-03								
024	Triax cable, CRE-Out line group1 out_8		FPPU	P13	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.513	285.48	7.888	548.9	251.10				3.69E-07	2.22E-06								
025	Triax cable, CRE-Out line group1 out_9		FPPU	P13	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
026	Triax cable, CRE-Out line group1 out_10		FPPU	P13	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
027	Triax cable, CRE-Out line group1 out_11		FPPU	P13	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
028	Triax cable, CRE-Out line group1 out_12		FPPU	P13	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
029	Triax cable, CRE-Out line group1 out_13		FPPU	P13	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	534.47	265.53				3.69E-07	2.22E-06								
030	Shielded cable, Synch_1		FPPU	P13	2	1			400	2.00E-05	0.0300	1	H02138	SST	0.088	0	0.771		60	2.386	143.16	7.771	282.66	117.34				1.44E-06	8.64E-06								
031	Shielded cable, Clock_1		FPPU	P13	2	1			400	2.50E-04	0.1000	1	H02138	SST	0.088	0	0.771		60	2.386	143.16	7.771	282.66	117.34				7.50E-04	4.50E-03								
013b	Shielded cable, Outrefb_1		FPPU	P13	1	2			800	1.00E-04	0.1667	1	H01238	SST	0.231	0	2.506		113.6	2.386	271.05	7.771	299.57	500.43				1.89E-04	1.14E-03								
075	Shielded cable, Temp.sens Tsens1/2		FPPU	P14	11	1			800	1.00E-05	0.0300	1	H11138	SST	0.218	0	1.898		113.6	2.512	285.36	7.897	548.78	251.22				3.75E-06	2.25E-05								
Sum Bundle 01																							4.585	0	47.009									1.27E-03	7.61E-03		
004	Shielded cable, CRE DC/logic supply 2		FPPU	P17	2				400	3.00E-05	0.1667	1	H11138(2)	SST	0.016	0	0.086		60	2.438	146.28	8.255	306.44	93.56				1.80E-05	1.08E-04								
004	Shielded cable, CRE DC/logic supply 2		FPPU	P17	8	1			800	1.00E-05	0.1667	1	H11138(8)	SST	0.202	0	1.812		113.6	2.438	276.96	8.255	579.48	220.52				1.51E-05	9.09E-05								
005	Shielded cable, CRE DC supply 1		FPPU	P18	6	6			400	3.00E-05	0.1667	1	H24138(6)	SST	0.048	0	0.258		60	2.411	144.86	8.228	304.82	95.18				5.40E-05	3.24E-04								
005	Shielded cable, CRE DC supply 1		FPPU	P18	16	1			800	1.00E-05	0.1667	1	H24138(16)	SST	0.316	0	2.599		113.6	2.411	273.89	8.228	576.41	223.59				3.03E-05	1.82E-04								
006	Shielded cable, Det. Bias supply 1		FPPU	P18	6	1			800	1.00E-05	0.1667	1	H06138	SST	0.144	0	1.224		113.6	2.411	273.89	8.228	576.41	223.59				1.14E-05	6.82E-05								
032	Triax cable, CRE-Out line group2 out_14		FPPU	P16	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.439	277.07	8.256	579.59	220.41				3.69E-07	2.22E-06								
033	Triax cable, CRE-Out line group2 out_15		FPPU	P16	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.439	277.07	8.256	579.59	220.41				3.69E-07	2.22E-06								
034	Triax cable, CRE-Out line group2 out_16		FPPU	P16	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.439	277.07	8.256	579.59	220.41				3.69E-07	2.22E-06								
035	Triax cable, CRE-Out line group2 out_17		FPPU	P16	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.439	277.07	8.256	579.59	220.41				3.69E-07	2.22E-06								
036	Triax cable, CRE-Out line group2 out_18		FPPU	P16	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.439	277.07	8.256	579.59	220.41				3.69E-07	2.22E-06								
037	Triax cable, CRE-Out line group2 out_19		FPPU	P16	1	2	02		800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.439	277.07	8.256	579.59	220.41				3.69E-07	2.22E-06								
014a	Shielded cable, Outrefa_2		FPPU	P16	1	2			800	1.00E-04	0.1667	1	H01238	SST	0.231	0	2.506		113.6	2.439	277.07	8.256	579.59	220.41				1.89E-04	1.14E-03								
038	Triax cable, CRE-Out line group2 out_20		FPPU	P16	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.436	276.73	8.253	579.25	220.75				3.69E-07	2.22E-06								
039	Triax cable, CRE-Out line group2 out_21		FPPU	P15	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.436	276.73	8.253	579.25	220.75				3.69E-07	2.22E-06								
040	Triax cable, CRE-Out line group2 out_22		FPPU	P15	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.436	276.73	8.253	579.25	220.75				3.69E-07	2.22E-06								
041	Triax cable, CRE-Out line group2 out_23		FPPU	P15	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.436	276.73	8.253	579.25	220.75				3.69E-07	2.22E-06								
042	Triax cable, CRE-Out line group2 out_24		FPPU	P15	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.436	276.73	8.253	579.25	220.75				3.69E-07	2.22E-06								
043	Triax cable, CRE-Out line group2 out_25		FPPU	P15	1	2			800	5.00E-06	0.1300	1	H01238	SST	0.231	0	2.506		113.6	2.436	276.73	8.253	579.25	220.75				3.69E-07	2.22E-06								
044	Shielded cable, Synch_2		FPPU	P15	2	1			400	2.00E-05	0.0300	1	H02138	SST	0.088	0	0.771		60	2.436	146.16	8.253	306.32	93.68				1.44E-06	8.64E-06								
045	Shielded cable, Clock_2		FPPU	P15	2	1			400	2.50E-04	0.1000	1	H02138	SST	0.088	0	0.771		60	2.436	146.16	8.253	306.32	93.68				7.50E-04	4.50E-03								
014b	Shielded cable, Outrefb_2		FPPU	P15	1	2			800	1.00E-04	0.1667	1	H01238	SST	0.231	0	2.506		113.6	2.436	276.73	8.253	309.4	490.60				1.89E-04	1.14E-03								
Sum Bundle 02																							4.136	0	42.605										1.26E-03	7.58E-03	
007	Shielded cable, CRE DC supply 3		FPPU	P21	2				400	3.00E-05	0.1667	1	H11138(2)	SST	0.016	0	0.086		60	1.684	101.04	6.74	23														

Cable_ID	Designation			no_of_wires	no_of_shd's	Bundle_No. SH-CP-....	R_max_core (Ohm) at 300 K	l_nominal (A)	Duty_Cycle (T t)	Cable						CVV int. Harness CVV I/F-CB to CEU's			Harness total			REMARKS	P_el, avg [mW/m]	P_el Spec on (mW/m)	P_el Phot on (mW/m)
	Description	Unit	Connector							no_of_cables	cable_type	condu.	SST mm²	Brass mm²	Insulation mm²	R_core (Ohm/m) at 300 K	Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K	delta R (Ohm)				
602c	8 tw pairs shielded, SST, B1, Out+T_sens	FFPPU	P51	16	1	05	800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	2.468	280.36	8.345	588.46	211.54	1.21E-04	7.27E-04		
603	Shielded cable, SST, bias Bol B_1	FFPPU	P52	18	1		800	1.00E-05	0.1667	1	H19138	SST	0.296	0	2.145	113.6	2.454	278.77	8.331	586.86	213.14	3.41E-05	2.05E-04		
604	Shielded cable, SST, Clocks low level Bol B_1	FFPPU	P52	3	1		800	5.00E-05	0.1667	1	H03138	SST	0.064	0	0.856	113.6	2.454	278.77	8.331	586.86	213.14	1.42E-04	8.52E-04		
605	Shielded cable, SST, Clocks high level Bol	FFPPU	P52	10	1		800	5.00E-05	0.1667	1	H11138	SST	0.218	0	1.898	113.6	2.454	278.77	8.331	586.86	213.14	4.73E-04	2.84E-03		
603b	Shielded cable, Brass, bias, Bol B1	FFPPU	P52	2	1	02	80	3.00E-04	0.3333	1	H02130BS	Brass	0.106	0.102	1.34	1.4	2.454	3.44	8.331	8.0251	71.97	8.40E-05	5.04E-04		
	Sum Bundle 05												1.876	0.102	15.715						1.22E-03	0.00E+00	7.31E-03		
606b	8 tw pairs shielded, SST, B2, Out+T_sens	FFPPU	P53	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	2.389	271.39	8.354	581.88	218.12	1.21E-04	7.27E-04		
606c	8 tw pairs shielded, SST, B2, Out+T_sens	FFPPU	P53	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	2.389	271.39	8.354	581.88	218.12	1.21E-04	7.27E-04		
607b	8 tw pairs shielded, SST, B2, Out+T_sens	FFPPU	P54	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	2.362	268.32	8.327	578.82	221.18	1.21E-04	7.27E-04		
607c	8 tw pairs shielded, SST, B2, Out+T_sens	FFPPU	P54	16	1	02	800	2.00E-05	0.1667	1	H08-02138	SST	0.296	0	2.369	113.6	2.362	268.32	8.327	578.82	221.18	1.21E-04	7.27E-04		
608	Shielded cable, SST, bias Bol B_2	FFPPU	P55	18	1		800	1.00E-05	0.1667	1	H19138	SST	0.296	0	2.145	113.6	2.348	266.73	8.313	577.23	222.77	3.41E-05	2.05E-04		
609	Shielded cable, SST, Clocks low level Bol B_2	FFPPU	P55	3	1		800	5.00E-05	0.1667	1	H03138	SST	0.064	0	0.856	113.6	2.348	266.73	8.313	577.23	222.77	1.42E-04	8.52E-04		
610	Shielded cable, SST, Clocks high level Bol	FFPPU	P55	10	1		800	5.00E-05	0.1667	1	H11138	SST	0.218	0	1.898	113.6	2.348	266.73	8.313	577.23	222.77	4.73E-04	2.84E-03		
608b	Shielded cable, Brass, bias, Bol B2	FFPPU	P55	2	1		80	3.00E-04	0.3333	1	H02130BS	Brass	0.106	0.102	1.34	1.4	2.348	3.29	8.313	7.9231	72.08	8.40E-05	5.04E-04		
	Sum Bundle 06												1.876	0.102	15.715						1.22E-03	0.00E+00	7.31E-03		
611b	8 tw pairs shielded, SST, B3, Out+T_sens	FFPPU	P56	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.844	209.48	7.784	552.27	247.73	1.21E-04	7.27E-04		
611c	8 tw pairs shielded, SST, B3, Out+T_sens	FFPPU	P56	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.844	209.48	7.784	552.27	247.73	1.21E-04	7.27E-04		
612b	8 tw pairs shielded, SST, B3, Out+T_sens	FFPPU	P57	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.859	211.18	7.799	553.97	246.03	1.21E-04	7.27E-04		
612c	8 tw pairs shielded, SST, B3, Out+T_sens	FFPPU	P57	16	1	03	800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.859	211.18	7.799	553.97	246.03	1.21E-04	7.27E-04		
613	Shielded cable, SST, bias Bol B_3	FFPPU	P58	18	1		800	1.00E-05	0.1667	1	H19138	SST	0.286	0	2.145	113.6	1.882	213.80	7.822	556.59	243.41	3.41E-05	2.05E-04		
614	Shielded cable, SST, Clocks low level Bol B_3	FFPPU	P58	3	1		800	5.00E-05	0.1667	1	H03138	SST	0.1	0	0.856	113.6	1.882	213.80	7.822	556.59	243.41	1.42E-04	8.52E-04		
615	Shielded cable, SST, Clocks high level Bol	FFPPU	P58	10	1		800	5.00E-05	0.1667	1	H11138	SST	0.218	0	1.898	113.6	1.882	213.80	7.822	556.59	243.41	4.73E-04	2.84E-03		
613b	Shielded cable, Brass, bias, Bol B3	FFPPU	P58	2	1		80	3.00E-04	0.3333	1	H02130	Brass	0.106	0.102	1.34	1.4	1.882	2.63	7.822	7.5912	72.41	8.40E-05	5.04E-04		
	Sum Bundle 07												1.902	0.102	15.715						1.22E-03	0.00E+00	7.31E-03		
616b	8 tw pairs shielded, SST, B4, Out+T_sens	FFPPU	P59	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.674	190.17	8.285	576.31	223.69	1.21E-04	7.27E-04		
616c	8 tw pairs shielded, SST, B4, Out+T_sens	FFPPU	P59	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.674	190.17	8.285	576.31	223.69	1.21E-04	7.27E-04		
617b	8 tw pairs shielded, SST, B4, Out+T_sens	FFPPU	P60	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.65	187.44	8.261	573.59	226.41	1.21E-04	7.27E-04		
617c	8 tw pairs shielded, SST, B4, Out+T_sens	FFPPU	P60	16	1	03	800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.65	187.44	8.261	573.59	226.41	1.21E-04	7.27E-04		
618	Shielded cable, SST, bias Bol B_4	FFPPU	P61	18	1		800	1.00E-05	0.1667	1	H19138	SST	0.286	0	2.145	113.6	1.633	185.51	8.244	571.65	228.35	3.41E-05	2.05E-04		
619	Shielded cable, SST, Clocks low level Bol B_4	FFPPU	P61	3	1		800	5.00E-05	0.1667	1	H03138	SST	0.1	0	0.856	113.6	1.633	185.51	8.244	571.65	228.35	1.42E-04	8.52E-04		
620	Shielded cable, SST, Clocks high level Bol	FFPPU	P61	10	1		800	5.00E-05	0.1667	1	H11138	SST	0.218	0	1.898	113.6	1.633	185.51	8.244	571.65	228.35	4.73E-04	2.84E-03		
618b	Shielded cable, Brass, bias, Bol B4	FFPPU	P61	2	1		80	3.00E-04	0.3333	1	H02130	Brass	0.106	0.102	1.34	1.4	1.633	2.29	8.244	7.8494	72.15	8.40E-05	5.04E-04		
	Sum Bundle 08												1.902	0.102	15.715						1.22E-03	0.00E+00	7.31E-03		
621b	8 tw pairs shielded, SST, R1, Out+T_sens	FFPPU	P62	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.565	177.78	8.239	559.07	240.93	1.21E-04	7.27E-04		
621c	8 tw pairs shielded, SST, R1, Out+T_sens	FFPPU	P62	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.565	177.78	8.239	559.07	240.93	1.21E-04	7.27E-04		
622	Shielded cable, SST, bias	FFPPU	P63	18	1	03	800	1.00E-05	0.1667	1	H19138	SST	0.286	0	2.145	113.6	1.55	176.08	8.224	557.37	242.63	3.41E-05	2.05E-04		
623	Shielded cable, SST, Clocks low level Bol R1	FFPPU	P63	3	1		800	5.00E-05	0.1667	1	H03138	SST	0.1	0	0.856	113.6	1.55	176.08	8.224	557.37	242.63	1.42E-04	8.52E-04		
624	Shielded cable, SST, Clocks high level Bol R1	FFPPU	P63	10	1		800	5.00E-05	0.1667	1	H11138	SST	0.218	0	1.898	113.6	1.55	176.08	8.224	557.37	242.63	4.73E-04	2.84E-03		
622b	Shielded cable, Brass, bias, Bol R1	FFPPU	P63	2	1		80	3.00E-04	0.3333	1	H02130	Brass	0.106	0.102	1.34	1.4	1.55	2.17	8.224	7.6998	72.30	8.40E-05	5.04E-04		
	Sum Bundle 09												1.306	0.102	10.977						9.76E-04	0.00E+00	5.86E-03		
625b	8 tw pairs shielded, SST, R2, Out+T_sens	FFPPU	P64	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.454	165.17	8.086	540.78	259.22	1.21E-04	7.27E-04		
625c	8 tw pairs shielded, SST, R2, Out+T_sens	FFPPU	P64	16	1		800	2.00E-05	0.1667	1	H08-02138	SST	0.298	0	2.369	113.6	1.454	165.17	8.086	540.78	259.22	1.21E-04	7.27E-04		

HERSCHEL Cryo-Harness Tables PACS (int.)

Cable ID	Designation	Connector			no. of wires		no. of shd's		Bundle No. SH-CP-....	Upper chain	R_max_core (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (T)	Cable						CVV int. Harness CVV I/F-CB to CEU's			Harness total			REMARKS	P_el, avg [mW/m]	P_el Spec on (mW/m)	P_el Phot on (mW/m)
		Unit	no. of_wires	no. of_shd's	no. of_cables	cond.	SST mm²	Brass mm²						Insulation mm²	R_core (Ohm/m) at 300 K	Harness lth (m)	R_max (Ohm)	Harness lth (m)	R_max (Ohm)	Harness lth (m) total	R_max (Ohm) total at 300 K	delta R (Ohm)							
626	Shielded cable, SST, bias	FPPU	P65	18	1	10	3	800	1.00E-05	0.1667	1	H19138	SST	0.286	0	2.145	113.6	1.478	167.90	8.11	543.51	256.49	3.41E-05	2.05E-04					
627	Shielded cable, SST, Clocks low level Bol R2	FPPU	P65	3	1			800	5.00E-05	0.1667	1	H03138	SST	0.1	0	0.856	113.6	1.478	167.90	8.11	543.51	256.49	1.42E-04	8.52E-04					
628	Shielded cable, SST, Clocks high level Bol R2	FPPU	P65	10	1			800	5.00E-05	0.1667	1	H11138	SST	0.218	0	1.898	113.6	1.478	167.90	8.11	543.51	256.49	4.73E-04	2.84E-03					
626b	Shielded cable, Brass, bias, Bol R2	FPPU	P65	2	1			80	3.00E-04	0.3333	1	H02130	Brass	0.105	0.102	1.34	1.4	1.478	2.07	8.11	7.531	72.47	8.40E-05	5.04E-04					
	Sum Bundle 10													1.306	0.102	10.977						9.76E-04	0.00E+00	5.86E-03					
629	2 tw.pairs, shielded, SST, Bol SP_Temp	FPPU	P68	4	1			800	1.00E-06	0.0300	1	H02-02138	SST	0.141	0	1.299	113.6	1.414	160.63	8.504	585.66	214.34	1.36E-08	8.18E-08					
630	2 tw.pairs, shielded, SST, Bol EV_Temp	FPPU	P68	4	1			800	1.00E-06	0.0300	1	H02-02138	SST	0.141	0	1.299	113.6	1.414	160.63	8.504	585.66	214.34	1.36E-08	8.18E-08					
631	2 tw.pairs, shielded, SST, Bol HSP_Temp	FPPU	P68	4	1			800	1.00E-06	0.0300	1	H02-02138	SST	0.141	0	1.299	113.6	1.414	160.63	8.504	585.66	214.34	1.36E-08	8.18E-08					
632	2 tw.pairs, shielded, SST, Bol HSE_Temp	FPPU	P68	4	1			800	1.00E-06	0.0300	1	H02-02138	SST	0.141	0	1.299	113.6	1.414	160.63	8.504	585.66	214.34	1.36E-08	8.18E-08					
633	2 tw.pairs, shielded, SST, Bol SHUNT_Temp	FPPU	P68	4	1			800	1.00E-06	0.0300	1	H02-02138	SST	0.141	0	1.299	113.6	1.414	160.63	8.504	585.66	214.34	1.36E-08	8.18E-08					
634	6 tw.pairs, shielded, Brass, Cooler Ts/Heater	FPPU	P68	12	1		3	8	2.50E-02	0.0170	1	H06-02130	BRASS	0.274	0.612	5.024	1.4	1.414	1.98	8.504	8.0563	-0.06	1.79E-01	1.07E+00					
641	2 tw.pairs, shielded, SST, Bol 300mk_Temp	FPPU	P66	4	1			800	1.00E-06	0.0300	1	H02-02138	SST	0.141	0	1.299	113.6	1.414	160.40	8.502	585.43	214.57	1.36E-08	8.18E-08					
642	2 tw.pairs, shielded, SST, Bol 300mk_Temp	FPPU	P66	4	1			800	1.00E-06	0.0300	1	H02-02138	SST	0.141	0	1.299	113.6	1.414	160.40	8.502	585.43	214.57	1.36E-08	8.18E-08					
643	2 tw.pairs, shielded, SST, Bol FPU_Temp	FPPU	P66	4	1			800	1.00E-06	0.0300	1	H02-02138	SST	0.141	0	1.299	113.6	1.414	160.40	8.502	585.43	214.57	1.36E-08	8.18E-08					
644	2 tw.pairs, shielded, SST, Bol FPU_heater	FPPU	P66	4	1			8	2.00E-05	0.1667	1	H02-02130	BRASS	0.172	0.204	2.236	1.4	1.414	1.98	8.502	8.0535	-0.05	3.73E-07	2.24E-06					
	Sum Bundle 11													1.574	0.816	17.652						1.79E-01	0.00E+00	1.07E+00					
635	2 tw.pairs, shielded, SST, Bol SP_Temp	FPPU	P69	4	1			800	0.00E+00	0.0030	1	H02-02138	SST	0.141	0	1.299	113.6	1.403	159.38	8.596	603.14	196.86	0.00E+00						
636	2 tw.pairs, shielded, SST, Bol EV_Temp	FPPU	P69	4	1			800	0.00E+00	0.0030	1	H02-02138	SST	0.141	0	1.299	113.6	1.403	159.38	8.596	603.14	196.86	0.00E+00						
637	2 tw.pairs, shielded, SST, Bol HSP_Temp	FPPU	P69	4	1			800	0.00E+00	0.0030	1	H02-02138	SST	0.141	0	1.299	113.6	1.403	159.38	8.596	603.14	196.86	0.00E+00						
638	2 tw.pairs, shielded, SST, Bol HSE_Temp	FPPU	P69	4	1			800	0.00E+00	0.0030	1	H02-02138	SST	0.141	0	1.299	113.6	1.403	159.38	8.596	603.14	196.86	0.00E+00						
639	2 tw.pairs, shielded, SST, Bol SHUNT_Temp	FPPU	P69	4	1			800	0.00E+00	0.0030	1	H02-02138	SST	0.141	0	1.299	113.6	1.403	159.38	8.596	603.14	196.86	0.00E+00						
640	6 tw.pairs, shielded, Brass, Cooler Ts/Heater	FPPU	P69	12	1		3	8	0.00E+00	0.0170	1	H06-02130	BRASS	0.274	0.612	5.024	1.4	1.403	1.96	8.596	8.2562	-0.26	0.00E+00						
645	2 tw.pairs, shielded, SST, Bol 300mk_Temp	FPPU	P67	4	1			800	0.00E+00	0.0000	1	H02-02138	SST	0.141	0	1.299	113.6	1.409	160.06	8.602	603.82	196.18	0.00E+00						
646	2 tw.pairs, shielded, SST, Bol 300mk_Temp	FPPU	P67	4	1			800	0.00E+00	0.0000	1	H02-02138	SST	0.141	0	1.299	113.6	1.409	160.06	8.602	603.82	196.18	0.00E+00						
647	2 tw.pairs, shielded, SST, Bol FPU_Temp	FPPU	P67	4	1			800	0.00E+00	0.0000	1	H02-02138	SST	0.141	0	1.299	113.6	1.409	160.06	8.602	603.82	196.18	0.00E+00						
648	2 tw.pairs, shielded, SST, Bol FPU_heater	FPPU	P67	4	1			8	0.00E+00	0.0000	1	H06-02130	BRASS	0.172	0.204	2.236	1.4	1.409	1.97	8.602	8.2646	-0.26	0.00E+00						
	Sum Bundle 12													1.574	0.816	17.652						0.00E+00	0.00E+00	0.00E+00					
077	Shielded cable, Brass, Fwheel1 drive	FPPU	P01	4	1			8	2.50E-01	0.0030	1	H02-02130	BRASS	0.172	0.204	2.236	1.4	2.418	3.39	8.323	7.6297	0.37	1.05E+00	6.30E+00					
078	Shielded cable, SST, FW1 Hall Sens1	FPPU	P01	4	1			800	1.00E-03	0.0030	1	H04138	SST	0.114	0	0.982	113.6	2.418	274.68	8.323	547.98	252.02	1.36E-03	8.18E-03					
079	Shielded cable, SST, FW1 Hall Sens2	FPPU	P01	4	1			800	1.00E-03	0.0030	1	H04138	SST	0.114	0	0.982	113.6	2.418	274.68	8.323	547.98	252.02	1.36E-03	8.18E-03					
080	Shielded cable, SST, FW1 Pos Sens	FPPU	P01	8	1			800	2.00E-03	0.0030	1	H08138	SST	0.166	0	1.323	113.6	2.418	274.68	8.323	547.98	252.02	1.09E-02	6.54E-02					
081	Shielded cable, SST, FW1 Temp Sens	FPPU	P01	4	1			800	1.00E-04	0.0030	1	H04138	SST	0.114	0	0.982	113.6	2.418	274.68	8.323	547.98	252.02	1.36E-04	8.18E-04					
087	Shielded cable, Brass, Fwheel2 drive	FPPU	P03	4	1			8	2.50E-01	0.0030	1	H02-02130	BRASS	0.172	0.204	2.236	1.4	2.805	3.93	8.71	8.1715	-0.17	1.05E+00	6.30E+00					
088	Shielded cable, SST, FW2 Hall Sens1	FPPU	P03	4	1			800	1.00E-03	0.0030	1	H04138	SST	0.114	0	0.982	113.6	2.805	318.65	8.71	591.95	208.05	1.36E-03	8.18E-03					
089	Shielded cable, SST, FW2 Hall Sens2	FPPU	P03	4	1			800	1.00E-03	0.0030	1	H04138	SST	0.114	0	0.982	113.6	2.805	318.65	8.71	591.95	208.05	1.36E-03	8.18E-03					
090	Shielded cable, SST, FW2 Pos Sens	FPPU	P03	8	1			800	2.00E-03	0.0030	1	H08138	SST	0.166	0	1.323	113.6	2.805	318.65	8.71	591.95	208.05	1.09E-02	6.54E-02					
091	Shielded cable, SST, FW2 Temp Sens	FPPU	P03	4	1			800	1.00E-04	0.0030	1	H04138	SST	0.114	0	0.982	113.6	2.805	318.65	8.71	591.95	208.05	1.36E-04	8.18E-04					
124	Shielded cable, SST, 2 FPU T Sensors red.	FPPU	P09	8	1		2	1000	0.00E+00	0.0000	1	H08138	SST	0.166	0	1.323	113.6	2.469	280.48	8.374	553.78	446.22	0.00E+00						
113	Shielded cable, SST, Chip Pos Sens1	FPPU	P07	4	1			400	5.00E-04	0.3333	1	H08138(4)	SST	0.134	0	1.151	60	2.666	159.96	8.571	304.73	95.27	2.00E-02	6.00E-02					
113	Shielded cable, SST, Chip Pos Sens1	FPPU	P07	4	1			800	1.00E-05	0.3333	1	H08138(4)	SST	0	0	0	113.6	2.666	302.86	8.571	576.16	223.84	1.51E-05	4.54E-05					
114	Shielded cable, SST, Chip Pos Sens2	FPPU	P07	4	1			400	5.00E-04	0.3333	1	H08138(4)	SST	0	0	0	113.6	2.666	302.86	8.571	576.16	223.84	1.51E-05	4.54E-05					
114	Shielded cable, SST, Chip Pos Sens2	FPPU	P07	4	1			800	1.00E-05	0.3333	1	H08138(4)	SST	0	0	0	113.6	2.666	302.86	8.571	576.16	223.84	1.51E-05	4.54E-05					
115	Shielded cable, SST, Chip T Sensor	FPPU	P07	4	1			800	1.00E-05	0.0000	1	H04138	SST	0.114	0	0.982	113.6	2.666	302.86	8.571	576.16	223.84	1.36E-06	8.18E-06					
116	Shielded cable, Brass, Chopper drive	FPPU	P07	4	1			8	1.20E-02	0.3333	1	H02-02130	BRASS	0.172	0.204	2.236	1.4	2.666	3.73	8.571	7.9769	0.02	2.69E-01	8.06E-01					
116a	Shielded cable, Brass, Chopper drive	FPPU	P07	4	1			8	1.20E-02	0.3333	1	H02-02130	BRASS	0.172	0.204	2.236	1.4	2.666	3.73	8.571	7.9769	0.02	2.69E-01	8.06E-01					

HERSCHEL
Cryostat Outside

SVM I/F-CB
312000

Struts
(80-300K)

Cylinder
(60-80K)

U-Profiles
211121 UPPER RING

CVV - CB
210000

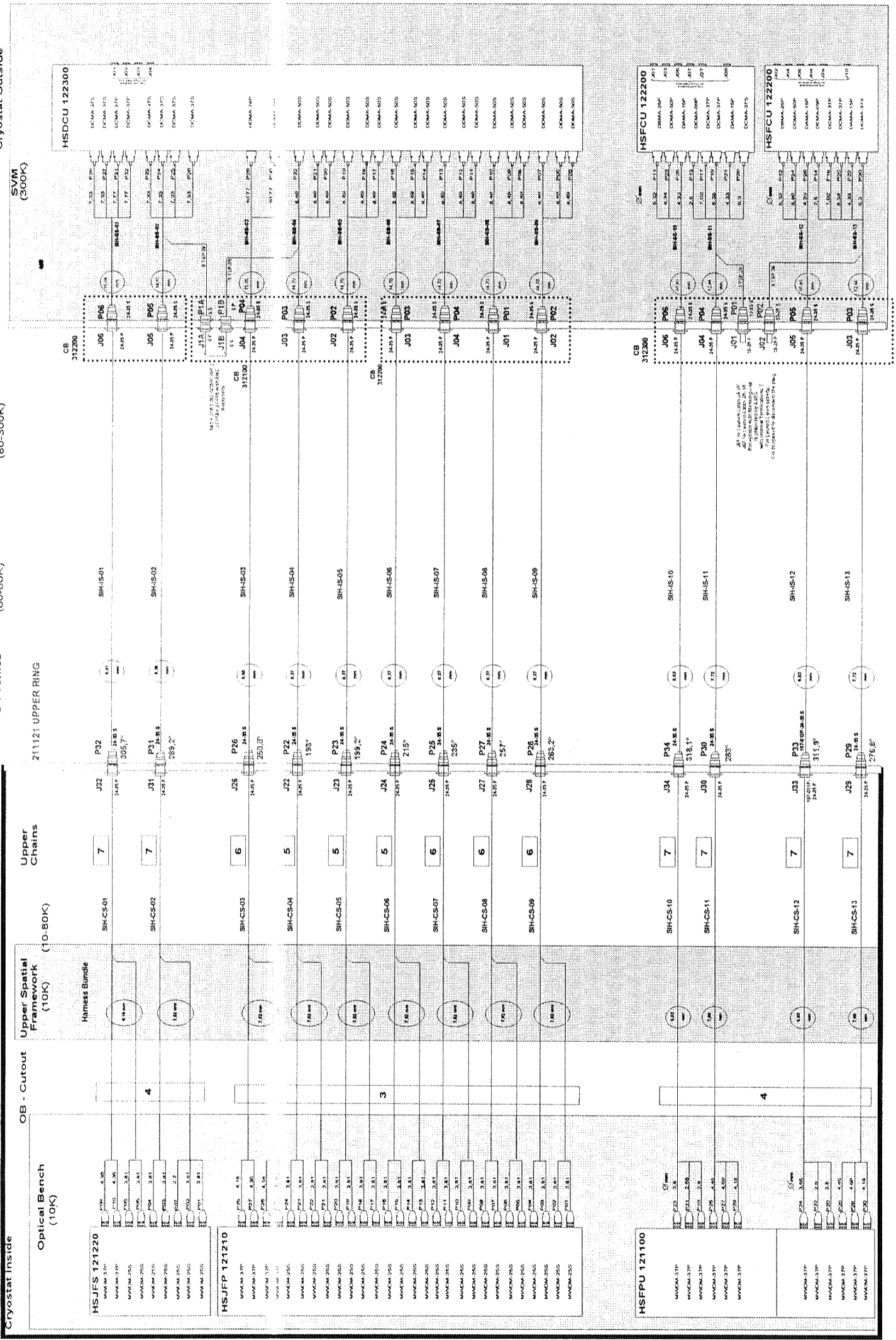
Upper
Chains

Upper Spatial
Framework
(10K)

OB - Cutout
Upper Spatial
Framework
(10K)

Optical
Bench
(10K)

Cryostat Inside



FREIGABE:		FESTIGKEIT:		VERTEILER:		DATUM:	
HP-2-ASED-ID-0091-01-0B		HP-2-ASED-ID-0091-01-0B		CM:		CM:	
FREIGABE AUSGABE:		ZUL. ABM.:		OBERFL.:		MASSTAB:	
						VERKSTOFF:	
						GEW.:	
						SPiRE (PFM)	
						Cryo Harness Interconnection Diagram	
						astrium	
						2547-121430-030-01-0B	
						ERS. F.:	
						ERS. D.:	
						BAIT	
						1	
						1 BL	

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Cable ID	Designation		Unit	Connector	no_of_wires	no_of_shd's	Bundle_No. SIH-IS-xx	U-Profile-No.	Strut-No.	R_max (Ohm) at 300 K	L_nominal (A)	Duty_Cycle (T ⁻¹)	Cable								CVW ext.Harness CVW-I/F-CB to SVM- CB						P_el avg.(mW/m)	P_el Spec on (mW/m)	P_el Phot on (mW/m)	Remarks	
	no_of_cables	cable_type											conductor	R_core Ohm/m at 300 K	Manganin [mm ²]	SST [mm ²]	Brass [mm ²]	Insulation [mm ²]	R_core Ohm/m at 300 K	Harness lth (m)	R_max (Ohm)	delta R (Ohm)									
I/S01	12 ch. SLW Bolometer (1 -12)		DCU	P27	24	12				500	5.00E-10	0.1700	12	H02138	SST	113.6					1.056	0	9.252	113.6	2.767	314.33	185.34	1.16E-13	6.95E-13		
I/S01	Ground Wire		DCU	P27	1	0				50	0.00E+00	0.0000	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.767	3.87	45.79	0.00E+00	0.00E+00		
I/S01	12 ch. SLW Bolometer (13-24)		DCU	P28	24	12				500	5.00E-10	0.1700	12	H02138	SST	113.6					1.056	0	9.252	113.6	2.767	314.33	185.34	1.16E-13	6.95E-13		
I/S01	Ground Wire		DCU	P28	1	0				50	0.00E+00	0.0000	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.767	3.87	45.79	0.00E+00	0.00E+00		
I/S01	PTC Bias		DCU	P31	2	1				100	8.00E-09	0.1700	1	H02138	BRASS	9.5					0.08	0.016	0.981	9.5	2.767	26.29	73.38	2.07E-13	1.24E-12		
I/S01	PTC Ground wire		DCU	P31	1	0				50	0.00E+00	0.0000	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.767	3.87	45.79	0.00E+00	0.00E+00		
I/S01	PTC JFET Bias		DCU	P31	2	1				100	2.00E-04	0.1700	1	H02138	BRASS	9.5					0.08	0.016	0.981	9.5	2.767	26.29	73.38	1.29E-04	7.75E-04		
I/S01	SLW Bolometer		DCU	P31	4	2				100	2.40E-08	0.1700	2	H02138	BRASS	9.5					0.16	0.032	1.962	9.5	2.767	26.29	73.38	3.72E-12	2.23E-11		
I/S01	SLW JFET Bias		DCU	P31	4	2				100	6.00E-04	0.1700	2	H02138	BRASS	9.5					0.16	0.032	1.962	9.5	2.767	26.29	73.38	2.33E-03	1.40E-02		
I/S01	SLW Ground wire		DCU	P31	1	0				50	0.00E+00	0.0000	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.767	3.87	45.79	0.00E+00	0.00E+00		
I/S01	SSW Bolometer Bias		DCU	P31	4	2				100	4.80E-08	0.1700	2	H02138	BRASS	9.5					0.16	0.032	1.962	9.5	2.767	26.29	73.38	1.49E-11	8.93E-11		
I/S01	SSW JFET Bias		DCU	P31	4	2				100	1.20E-03	0.1700	2	H02138	BRASS	9.5					0.16	0.032	1.962	9.5	2.767	26.29	73.38	9.30E-03	5.58E-02		
I/S01	SSW Ground wire		DCU	P31	1	0				50	0.00E+00	0.0000	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.767	3.87	45.79	0.00E+00	0.00E+00		
I/S01	PTC JFET Heater		DCU	P31	2	1	01	4041	39	200	4.81E-04	0.1700	1	H02138	BRASS	9.5					0.08	0.016	0.981	9.5	2.767	26.29	173.38	7.47E-04	4.48E-03		
I/S01	SLW JFET Heater		DCU	P31	2	1				200	8.35E-04	0.1700	1	H02138	BRASS	9.5					0.08	0.016	0.981	9.5	2.767	26.29	173.38	2.24E-03	1.34E-02		
I/S01	SSW JFET Heater		DCU	P31	2	1				200	1.67E-03	0.1700	1	H02138	BRASS	9.5					0.08	0.016	0.981	9.5	2.767	26.29	173.38	9.01E-03	5.40E-02		
I/S01	PTC Bias		DCU	P32	2	1				100	8.00E-09	0.1700	1	H02138	BRASS	9.5					0.08	0.016	0.981	9.5	2.767	26.29	73.38	2.07E-13	1.24E-12		
I/S01	PTC Ground wire		DCU	P32	1	0				50	0.00E+00	0.0000	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.767	3.87	45.79	0.00E+00	0.00E+00		
I/S01	PTC JFET Bias		DCU	P32	2	1				100	2.00E-04	0.1700	1	H02138	BRASS	9.5					0.08	0.016	0.981	9.5	2.767	26.29	73.38	1.29E-04	7.75E-04		
I/S01	SLW Bolometer		DCU	P32	4	2				100	2.40E-08	0.1700	2	H02138	BRASS	9.5					0.16	0.032	1.962	9.5	2.767	26.29	73.38	3.72E-12	2.23E-11		
I/S01	SLW JFET Bias		DCU	P32	4	2				100	6.00E-04	0.1700	2	H02138	BRASS	9.5					0.16	0.032	1.962	9.5	2.767	26.29	73.38	2.33E-03	1.40E-02		
I/S01	SLW Ground wire		DCU	P32	1	0				50	0.00E+00	0.0000	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.767	3.87	45.79	0.00E+00	0.00E+00		
I/S01	SSW Bolometer Bias		DCU	P32	4	2				100	4.80E-08	0.1700	2	H02138	BRASS	9.5					0.16	0.032	1.962	9.5	2.767	26.29	173.38	1.49E-11	8.93E-11		
I/S01	SSW JFET Bias		DCU	P32	4	2				100	1.20E-03	0.1700	2	H02138	BRASS	9.5					0.16	0.032	1.962	9.5	2.767	26.29	173.38	9.30E-03	5.58E-02		
I/S01	SSW Ground wire		DCU	P32	1	0				50	0.00E+00	0.0000	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.767	3.87	45.79	0.00E+00	0.00E+00		
I/S01	PTC JFET Heater		DCU	P32	2	1				200	4.81E-04	0.1700	1	H02138	BRASS	9.5					0.08	0.016	0.981	9.5	2.767	26.29	173.38	7.47E-04	4.48E-03		
I/S01	SLW JFET Heater		DCU	P32	2	1				200	8.35E-04	0.1700	1	H02138	BRASS	9.5					0.08	0.016	0.981	9.5	2.767	26.29	173.38	2.24E-03	1.34E-02		
I/S01	SSW JFET Heater		DCU	P32	2	1				200	1.67E-03	0.1700	1	H02138	BRASS	9.5					0.08	0.016	0.981	9.5	2.767	26.29	173.38	9.01E-03	5.40E-02		
	Sum Bundle 01				108	50														4.192	0.824	45.034					0.047508	0.2850469			
I/S02	Bolometer signals from JFS (SSW 1-12)		DCU	P23	24	12	02	3900		500	5.00E-10	0.1700	12	H02138	SST	113.6					1.056	0	9.252	113.6	2.504	284.45	215.22	1.16E-13	6.95E-13		
I/S02	SSW Ground wire		DCU	P23	1	0				50	0.00E+00	0.1700	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.504	3.51	46.16	0.00E+00	0.00E+00		
I/S02	Bolometer signals from JFS (SSW 13-24)		DCU	P24	24	12				500	5.00E-10	0.1700	12	H02138	SST	113.6					1.056	0	9.252	113.6	2.504	284.45	215.22	1.16E-13	6.95E-13		
I/S02	SSW Ground wire		DCU	P24	1	0				50	0.00E+00	0.1700	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.504	3.51	46.16	0.00E+00	0.00E+00		
I/S02	Bolometer signals from JFS (SSW 25-36)		DCU	P25	24	12				500	5.00E-10	0.1700	12	H02138	SST	113.6					1.056	0	9.252	113.6	2.504	284.45	215.22	1.16E-13	6.95E-13		
I/S02	SSW Ground wire		DCU	P25	1	0				50	0.00E+00	0.1700	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.504	3.51	46.16	0.00E+00	0.00E+00		
I/S02	Bolometer signals from JFS (SSW 37-42)		DCU	P26	24	12				500	5.00E-10	0.1700	12	H02138	SST	113.6					1.056	0	9.252	113.6	2.504	284.45	215.22	1.16E-13	6.95E-13		
I/S02	SSW Ground wire		DCU	P26	1	0				50	0.00E+00	0.1700	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.504	3.51	46.16	0.00E+00	0.00E+00		
	Sum Bundle 02				100	48														4.224	0.204	37.52					4.63E-13	2.781E-12			
I/S03	PSW JFET Bias		DCU	P29	12	6				100	1.20E-03	0.1700	6	H02138	BRASS	9.5					0.48	0.096	5.886	9.5	2.435	23.13	76.48	2.79E-02	1.67E-01		
I/S03	PSW Ground		DCU	P29	1	1				50	0.00E+00	0.0000	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.435	3.41	46.20	0.00E+00	0.00E+00		
I/S03	PSW Bolometer Bias		DCU	P29	6	3				100	9.60E-08	0.1700	3	H02138	BRASS	9.5					0.24	0.048	2.943	9.5	2.435	23.13	76.48	8.93E-11	5.36E-10		
I/S03	PSW Heater		DCU	P29	6	3				200	9.62E-04	0.0017	3	H02138	BRASS	9.5					0.18	0.048	2.073	9.5	2.435	23.13	76.48	8.97E-05	5.38E-04		
I/S03	PMW JFET Bias		DCU	P29	8	4				100	1.20E-03	0.0017	4	H02138	BRASS	9.5					0.32	0.064	3.924	9.5	2.435	23.13	76.48	1.86E-04	1.12E-03		
I/S03	PMW Bolometer Bias		DCU	P29	4	2				100	9.60E-08	0.0017	2	H02138	BRASS	9.5					0.12	0.032	1.382	9.5	2.435	23.13	76.48	5.95E-13	3.57E-12		
I/S03	PMW Ground		DCU	P29	1	0				50	0.00E+00	0.0000	1	H01030	BRASS	1.4					0	0.051	0.128	1.4	2.435	3.41	46.20	0.00E+00	0.00E+00		
I/S03	PMW JFET Heater		DCU	P29	4	2				200	9.62E-04	0.0017	2	H02138	BRASS	9.5					0.12	0.032	1.382	9.5	2.435	23.13	76.48	5.98E-05	3.59E-04		
I/S03	PLM JFET Heater		DCU	P29	2	1				200	9.62E-04	0.0017	1	H02138	BRASS	9.5					0.06	0.016	0.691	9.5	2.435	23.13	176.48	2.99E-05	1.79E-04		
I/S03	PLM JFET Bias		DCU	P29	4	2				100	1.20E-03	0.0017	2	H02138	BRASS	9.5					0.12	0.032	1.382	9.5	2.435	23.13	76.48	9.30E-05	5.58E-04		
I/S03	PLW Bolometer Bias		DCU	P29	4	2																									

Cable_ID	Description	Designation				U-Profile-No.	Strut-No.	R_max (Ohm) at 300 K	I_nominal (A)	Duty_Cycle (T %)	no_of_cables	cable_type	conductor	R_core Ohm/m at 300 K	Manganin [mm²]	SST [mm²]	Brass [mm²]	Insulation [mm²]	R_core Ohm/m at 300 K	Harness lth (m)	R_max (Ohm)	P_eI avg (mW/m)	P_eI Spec on (mW/m)	P_eI Phot on (mW/m)	Remarks
		Bundle_No.	SIH-xx	no_of_shts	Connector																				
I/S03	PMW JFET Bias																								
I/S03	PMW Bolometer Bias																								
I/S03	PMW Ground																								
I/S03	PMW JFET Heater																								
I/S03	PLM JFET Heater																								
I/S03	PLM JFET Bias																								
I/S03	PLW Bolometer Bias																								
I/S03	PMW Ground																								
	Sum Bundle 03																								
I/S04	16 ch. PMW (1-16)																								
I/S04	Ground Wire																								
I/S04	16 ch. PMW (17-32)																								
I/S04	Ground Wire																								
I/S04	16 ch. PMW (33-48)																								
I/S04	Ground Wire																								
	Sum Bundle 04																								
I/S05	16 ch. PMW (49-64)																								
I/S05	Ground Wire																								
I/S05	16 ch. PMW (65-80)																								
I/S05	Ground Wire																								
I/S05	16 ch. PMW (81-96)																								
I/S05	Ground Wire																								
	Sum Bundle 05																								
I/S06	16 ch. PLW (1-16)																								
I/S06	Ground Wire																								
I/S06	16 ch. PLW (17-32)																								
I/S06	Ground Wire																								
I/S06	16 ch. PLW (33-48)																								
I/S06	Ground Wire																								
	Sum Bundle 06																								
I/S07	16 ch. PSW (1-16)																								
I/S07	Ground Wire																								
I/S07	16 ch. PSW (17-32)																								
I/S07	Ground Wire																								
I/S07	16 ch. PSW (33-48)																								
I/S07	Ground Wire																								
	Sum Bundle 07																								
I/S08	16 ch. PSW (49-64)																								
I/S08	Ground Wire																								
I/S08	16 ch. PSW (65-80)																								
I/S08	Ground Wire																								
I/S08	16 ch. PSW (81-96)																								
I/S08	Ground Wire																								
	Sum Bundle 08																								
I/S09	16 ch. PMW (97-112)																								

Cable_n	Designation		Unit	Connector	no_of_wires	no_of_shds	Bundle_no. SIH-CS-xx	Upper chain	R_max (Ohm) at 300 K	I_nominal (A)	Duty_Cycle	no_of_cable	cable_types	condu.	SST [mm²]	Brass [mm²]	Insulation [mm²]	CVV int.Harness CVV-I/F-CB to CFU's				P_ei avg.(mW/m)	P_ei Spec on (mW/m)	P_ei Phot on (mW/m)	P_ei peak (mW/m)	Remarks
	Description																	R_core Ohm/m at 300 K	Harness lth (mm)	R_max (Ohm)	delta R (Ohm)					
C01	Bolometer signals from JFS (SLW 1-12)		HSJFS	P05	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.446	164.3	335.7	1.14E-13	6.82E-13			
C01	Anti-cross talk ground wires.		HSJFS	P05	12	0			500	0.00E+00	0.0000	1	H12-4032	SST	0.459	0	3.764	113.6	1.446	164.3	335.7	0.00E+00	0.00E+00			
C01	Bolometer signals from JFS (SLW 13-24)		HSJFS	P06	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.451	164.8	335.2	1.14E-13	6.82E-13			
C01	Anti-cross talk ground wires.		HSJFS	P06	12	0			500	0.00E+00	0.0000	1	H12-4032	SST	0.459	0	3.764	113.6	1.451	164.8	335.2	0.00E+00	0.00E+00			
C01	300-mK TC Bias		HSJFS	P09	2	1			200	8.00E-09	0.1667	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.418	12.8	187.2	1.92E-13	1.15E-12			
C01	300-mK Ground wire		HSJFS	P09	1	0			50	0	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.418	2.0	48.0	0.00E+00	0.00E+00			
C01	300-mK JFET Bias		HSJFS	P09	2	1			100	2.00E-04	0.1667	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.418	12.8	87.2	1.20E-04	7.20E-04			
C01	SLW Bolometer Bias		HSJFS	P09	4	2			200	2.40E-08	0.1667	2	H02138	SST	0.176	0	1.542	113.6	1.418	161.1	38.9	4.36E-11	2.62E-10			
C01	SLW JFET Bias		HSJFS	P09	4	2			100	6.00E-04	0.1667	2	H02138	BRASS	0.16	0.032	1.962	9.0	1.418	12.8	87.2	2.16E-03	1.30E-02			
C01	SLW Ground wire		HSJFS	P09	1	0			50	0	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.418	2.0	48.0	0.00E+00	0.00E+00			
C01	SSW Bolometer Bias		HSJFS	P09	4	2			200	4.80E-08	0.1667	2	H02138	SST	0.176	0	1.542	113.6	1.418	161.1	38.9	1.75E-10	1.05E-09			
C01	SSW JFET Bias		HSJFS	P09	4	2			100	1.20E-03	0.1667	2	H02138	BRASS	0.16	0.032	1.962	9.0	1.418	12.8	87.2	8.64E-03	5.19E-02			
C01	SSW Ground Wire		HSJFS	P09	1	0			50	0	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.418	2.0	48.0	0.00E+00	0.00E+00			
C01	300-mK TC JFET Heater		HSJFS	P09	2	1	01	07	200	4.80E-04	0.0006	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.418	12.8	187.2	2.41E-06	1.44E-05			
C01	SLW JFET Heater		HSJFS	P09	2	1			200	8.30E-04	0.0006	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.418	12.8	187.2	7.19E-06	4.32E-05			
C01	SSW JFET Heater		HSJFS	P09	2	1			200	1.70E-03	0.0006	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.418	12.8	187.2	3.02E-05	1.81E-04			
C01	300-mK TC Bias		HSJFS	P10	2	1			200	0.00E+00	0.1667	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.457	13.1	186.9	0.00E+00	0.00E+00			
C01	300-mK Ground wire		HSJFS	P10	1	0			50	0.00E+00	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.457	2.0	48.0	0.00E+00	0.00E+00			
C01	300-mK JFET Bias		HSJFS	P10	2	1			100	0.00E+00	0.1667	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.457	13.1	86.9	0.00E+00	0.00E+00			
C01	SLW Bolometer Bias		HSJFS	P10	4	2			200	0.00E+00	0.1667	2	H02138	SST	0.176	0	1.542	113.6	1.457	165.5	34.5	0.00E+00	0.00E+00			
C01	SLW JFET Bias		HSJFS	P10	4	2			100	0.00E+00	0.1667	2	H02138	BRASS	0.16	0.032	1.962	9.0	1.457	13.1	86.9	0.00E+00	0.00E+00			
C01	SLW Ground wire		HSJFS	P10	1	0			50	0.00E+00	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.457	2.0	48.0	0.00E+00	0.00E+00			
C01	SSW Bolometer Bias		HSJFS	P10	4	2			200	0.00E+00	0.1667	2	H02138	SST	0.176	0	1.542	113.6	1.457	165.5	34.5	0.00E+00	0.00E+00			
C01	SSW JFET Bias		HSJFS	P10	4	2			100	0.00E+00	0.1667	2	H02138	BRASS	0.16	0.032	1.962	9.0	1.457	13.1	86.9	0.00E+00	0.00E+00			
C01	SSW Ground Wire		HSJFS	P10	1	0			50	0.00E+00	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.457	2.0	48.0	0.00E+00	0.00E+00			
C01	300-mK TC JFET Heater		HSJFS	P10	2	1			200	0.00E+00	0.0006	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.457	13.1	186.9	0.00E+00	0.00E+00			
C01	SLW JFET Heater		HSJFS	P10	2	1			200	0.00E+00	0.0006	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.457	13.1	186.9	0.00E+00	0.00E+00			
C01	SSW JFET Heater		HSJFS	P10	2	1			200	0.00E+00	0.0006	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.457	13.1	186.9	0.00E+00	0.00E+00			
	Sum Bundle 01														4.898	0.594	47.178				0.010962	0.065772				
C02	Bolometer signals from JFS (300mK TC 1-3)		HSJFS	P07	8	1			500	5.00E-10	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.483	168.5	331.5	3.79E-14	2.27E-13			
C02	Anti-cross talk ground wires.		HSJFS	P07	4	0			500	0.00E+00	0.1667	0	H12-4032	SST	0	0	0	113.6	1.483	168.5	331.5	0.00E+00	0.00E+00			
C02	Bolometer signals from JFS (SSW 1-8)		HSJFS	P01	16	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.463	166.2	333.8	7.57E-14	4.54E-13			
C02	Anti-cross talk ground wires.		HSJFS	P01	8	0			500	0.00E+00	0.1667	0	H12-4032	SST	0	0	0	113.6	1.463	166.2	333.8	0.00E+00	0.00E+00			
C02	Bolometer signals from JFS (SSW 9-20)		HSJFS	P02	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.472	167.2	332.8	1.14E-13	6.82E-13			
C02	Anti-cross talk ground wires.		HSJFS	P02	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.472	167.2	332.8	0.00E+00	0.00E+00			
C02	Bolometer signals from JFS (SSW 21-32)		HSJFS	P03	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.465	166.4	333.6	1.14E-13	6.82E-13			
C02	Anti-cross talk ground wires.		HSJFS	P03	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.465	166.4	333.6	0.00E+00	0.00E+00			
C02	Bolometer signals from JFS (SSW 33-44)		HSJFS	P04	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.454	165.2	334.8	1.14E-13	6.82E-13			
C02	Anti-cross talk ground wires.		HSJFS	P04	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.454	165.2	334.8	0.00E+00	0.00E+00			
	Sum Bundle 02														5.508	0	45.168				0.000	0.000				
C03	PSW JFET Bias		HSJFP	P25	12	6			100	1.20E-03	0.1667	6	H02138	BRASS	0.48	0.096	5.886	9.0	1.297	11.7	88.3	2.59E-02		1.56E-01		
C03	PSW Ground		HSJFP	P25	1	0			50	0	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.297	1.8	48.2	0.00E+00		0.00E+00		
C03	PSW Bolometer Bias		HSJFP	P25	6	3			200	9.60E-08	0.1667	3	H02138	SST	0.264	0	2.313	113.6	1.297	147.3	52.7	1.05E-09		6.28E-09		
C03	PSW Heater		HSJFP	P25	6	3			200	9.60E-04	0.0006	3	H02138	BRASS	0.24	0.048	2.943	9.0	1.297	11.7	188.3	2.89E-05		1.73E-04		
C03	PMW JFET Bias		HSJFP	P27	8	4			100	1.20E-03	0.1667	4	H02138	BRASS	0.32	0.064	3.924	9.0	1.322	11.9	88.1	1.73E-02		1.04E-01		
C03	PMW Bolometer Bias		HSJFP	P27	4	2			200	9.60E-08	0.1667	2	H02138	SST	0.176	0	1.542	113.6	1.322	150.2	49.8	6.98E-10		4.19E-09		
C03	PMW Ground		HSJFP	P27	1	0			50	0	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.322	1.9	48.1	0.00E+00		0.00E+00		
C03	PMW JFET Heater		HSJFP	P27	4	2			200	9.60E-04	0.0006	2	H02138	BRASS	0.16	0.032	1.962	9.0	1.322	11.9	188.1	1.92E-05		1.15E-04		
C03	PLW JFET Heater		HSJFP	P27	2	1			200	9.60E-04																

Cable_n	Designation	Description	Unit	Connector	no_of_wires	no_of_shd's	Bundle_no. SIH-CS-xx	Upper chain	R_max (Ohm) at 300 K	I_nominal (A)	Duty_Cycle	no_of_cable	cable_types	condu.	SST [mm²]	Brass [mm²]	Insulation [mm²]	Cable				CVV int.Harness CVV-IF-CB to CFU's				P_eI avg.(mW/m)	P_eI Spec on (mW/m)	P_eI Phot on (mW/m)	P_eI peak (mW/m)	Remarks
																		Insulation [mm²]	Brass [mm²]	SST [mm²]	condu.	R_core Ohm/m at 300 K	Harness lth (mm)	R_max (Ohm)	delta R (Ohm)					
C03	PLW Ground		HSJFP	P27	1	0	03	06	50	0	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.322	1.9	48.1	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PSW JFET Bias		HSJFP	P26	12	6			100	0.00E+00	0.1667	6	H02138	BRASS	0.48	0.096	5.886	9.0	1.278	11.5	88.5	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PSW Ground		HSJFP	P26	1	0			50	0.00E+00	0.1667	1	H01030	BRASS	0.08	0.016	0.981	9.0	1.278	11.5	38.5	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PSW Bolometer Bias		HSJFP	P26	6	3			200	0.00E+00	0.1667	3	H02138	SST	0.264	0	2.313	113.6	1.278	145.2	54.8	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PSW Heater		HSJFP	P26	6	3			200	0.00E+00	0.0006	3	H02138	BRASS	0.24	0.048	2.943	9.0	1.278	11.5	188.5	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PMW JFET Bias		HSJFP	P28	8	4			100	0.00E+00	0.1667	4	H02138	BRASS	0.32	0.064	3.924	9.0	1.366	12.3	87.7	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PMW Bolometer Bias		HSJFP	P28	4	2			200	0.00E+00	0.1667	2	H01030	SST	0.176	0	1.542	113.6	1.366	155.2	44.8	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PMW Ground		HSJFP	P28	1	0			50	0.00E+00	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.366	11.5	48.1	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PMW JFET Heater		HSJFP	P28	4	2			200	0.00E+00	0.0006	2	H02138	BRASS	0.16	0.032	1.962	9.0	1.366	12.3	187.7	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PLW JFET Heater		HSJFP	P28	2	1			200	0.00E+00	0.0006	1	H02138	BRASS	0.08	0.016	0.981	9.0	1.366	12.3	187.7	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PLW JFET Bias		HSJFP	P28	4	2			100	0.00E+00	0.1667	2	H02138	BRASS	0.16	0.032	1.962	9.0	1.366	12.3	87.7	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PLW Bolometer Bias		HSJFP	P28	4	2			200	0.00E+00	0.1667	2	H02138	SST	0.176	0	1.542	113.6	1.366	155.2	44.8	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
C03	PLW Ground		HSJFP	P28	1	0			50	0.00E+00	0.1667	1	H01030	BRASS	0	0.051	0.128	1.4	1.366	11.5	48.1	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
	Sum Bundle 03														4.192	0.847	47.731					0.051908		0	0.311449					
C04	Bolometer signals from JFP (PMW 1-12)		HSJFP	P21	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.426	162.0	338.0	1.14E-13			6.82E-13					
C04	Anti-cross talk ground wires.		HSJFP	P21	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.426	162.0	338.0	0.00E+00			0.00E+00					
C04	Bolometer signals from JFP (PMW 13-24)		HSJFP	P22	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.412	160.4	339.6	1.14E-13			6.82E-13					
C04	Anti-cross talk ground wires.		HSJFP	P22	12	0	04		500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.412	160.4	339.6	0.00E+00			0.00E+00					
C04	Bolometer signals from JFP (PMW 25-36)		HSJFP	P23	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.401	159.2	340.8	1.14E-13			6.82E-13					
C04	Anti-cross talk ground wires.		HSJFP	P23	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.401	159.2	340.8	0.00E+00			0.00E+00					
C04	Bolometer signals from JFP (PMW 37-48)		HSJFP	P24	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.411	160.3	339.7	1.14E-13			6.82E-13					
C04	Anti-cross talk ground wires.		HSJFP	P24	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.411	160.3	339.7	0.00E+00			0.00E+00					
	Sum Bundle 04														5.508	0	45.168					4.54E-13		0.000	2.73E-12					
C05	Bolometer signals from JFP (PMW 49-60)		HSJFP	P17	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.425	161.9	338.1	1.14E-13			6.82E-13					
C05	Anti-cross talk ground wires.		HSJFP	P17	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.425	161.9	338.1	0.00E+00			0.00E+00					
C05	Bolometer signals from JFP (PMW 61-72)		HSJFP	P18	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.437	163.2	336.8	1.14E-13			6.82E-13					
C05	Anti-cross talk ground wires.		HSJFP	P18	12	0	05		500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.437	163.2	336.8	0.00E+00			0.00E+00					
C05	Bolometer signals from JFP (PMW 73-84)		HSJFP	P19	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.414	160.6	339.4	1.14E-13			6.82E-13					
C05	Anti-cross talk ground wires.		HSJFP	P19	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.414	160.6	339.4	0.00E+00			0.00E+00					
C05	Bolometer signals from JFP (PMW 85-96)		HSJFP	P20	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.403	159.4	340.6	1.14E-13			6.82E-13					
C05	Anti-cross talk ground wires.		HSJFP	P20	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.403	159.4	340.6	0.00E+00			0.00E+00					
	Sum Bundle 055														5.508	0	45.168					0.000		0.000	0.000					
C06	Bolometer signals from JFP (PLW 1-12)		HSJFP	P13	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.294	147.0	353.0	1.14E-13			6.82E-13					
C06	Anti-cross talk ground wires.		HSJFP	P13	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.294	147.0	353.0	0.00E+00			0.00E+00					
C06	Bolometer signals from JFP (PLW 13-24)		HSJFP	P14	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.281	145.5	354.5	1.14E-13			6.82E-13					
C06	Anti-cross talk ground wires.		HSJFP	P14	12	0	06		500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.281	145.5	354.5	0.00E+00			0.00E+00					
C06	Bolometer signals from JFP (PLW 25-36)		HSJFP	P15	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.292	146.8	353.2	1.14E-13			6.82E-13					
C06	Anti-cross talk ground wires.		HSJFP	P15	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.292	146.8	353.2	0.00E+00			0.00E+00					
C06	Bolometer signals from JFP (PLW 37-48)		HSJFP	P16	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.304	148.1	351.9	1.14E-13			6.82E-13					
C06	Anti-cross talk ground wires.		HSJFP	P16	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.304	148.1	351.9	0.00E+00			0.00E+00					
	Sum Bundle 06														5.508	0	45.168					4.54E-13		0.000	2.73E-12					
C07	Bolometer signals from JFP (PSW 1-12)		HSJFP	P09	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.205	136.9	363.1	1.14E-13			6.82E-13					
C07	Anti-cross talk ground wires.		HSJFP	P09	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.205	136.9	363.1	0.00E+00			0.00E+00					
C07	Bolometer signals from JFP (PSW 13-24)		HSJFP	P10	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.211	137.6	362.4	1.14E-13			6.82E-13					
C07	Anti-cross talk ground wires.		HSJFP	P10	12	0	07		500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.211	137.6	362.4	0.00E+00			0.00E+00					
C07	Bolometer signals from JFP (PSW 25-36)		HSJFP	P11	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.212	137.7	362.3	1.14E-13			6.82E-13					
C07	Anti-cross talk ground wires.		HSJFP	P11	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.212	137.7	362.3	0.00E+00			0.00E+00					

Cable_n	Designation	Description	Unit	Connector	no_of_wires	no_of_shd's	Bundle_no. SIH-CS-xx	Upper chain	R_max(Ohm) at 300 K	I_nominal (A)	Duty_Cycle	no_of_cable	cable_types	condu.	SST [mm²]	Brass [mm²]	Insulation [mm²]	CVV int.Harness CVV-I/F-CB to CFU's				P_ei avg.(mW/m)	P_ei Spec on (mW/m)	P_ei Phot on (mW/m)	P_ei peak (mW/m)	Remarks
																		R_core Ohm/m at 300 K	Harness lth (mm)	R_max (Ohm)	delta R (Ohm)					
C07	Bolometer signals from JFP (PSW 37-48)	HSJFP	P12	P12	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.205	363.1	1.14E-13	6.82E-13				
C07	Anti-cross talk ground wires.	HSJFP	P12	P12	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.205	363.1	0.00E+00	0.00E+00				
	Sum Bundle 07														5.508	0	45.168				4.54E-13	2.73E-12				
C08	Bolometer signals from JFP (PSW 49-60)	HSJFP	P05	P05	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.35	346.6	1.14E-13	6.82E-13				
C08	Anti-cross talk ground wires.	HSJFP	P05	P05	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.35	346.6	0.00E+00	0.00E+00				
C08	Bolometer signals from JFP (PSW 61-72)	HSJFP	P06	P06	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.346	347.1	1.14E-13	6.82E-13				
C08	Anti-cross talk ground wires.	HSJFP	P06	P06	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.346	347.1	0.00E+00	0.00E+00				
C08	Bolometer signals from JFP (PSW 73-84)	HSJFP	P07	P07	24	3	08		500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.352	346.4	1.14E-13	6.82E-13				
C08	Anti-cross talk ground wires.	HSJFP	P07	P07	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.352	346.4	0.00E+00	0.00E+00				
C08	Bolometer signals from JFP (PSW 85-96)	HSJFP	P08	P08	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.366	344.8	1.14E-13	6.82E-13				
C08	Anti-cross talk ground wires.	HSJFP	P08	P08	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.366	344.8	0.00E+00	0.00E+00				
	Sum Bundle 08														5.508	0	45.168				4.54E-13	2.73E-12				
C09	Bolometer signals from JFP (PSW 97-108)	HSJFP	P01	P01	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.366	344.8	1.14E-13	6.82E-13				
C09	Anti-cross talk ground wires.	HSJFP	P01	P01	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.366	344.8	0.00E+00	0.00E+00				
C09	Bolometer signals from JFP (PSW 109-120)	HSJFP	P02	P02	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.378	343.5	1.14E-13	6.82E-13				
C09	Anti-cross talk ground wires.	HSJFP	P02	P02	12	0	09		500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.378	343.5	0.00E+00	0.00E+00				
C09	Bolometer signals from JFP (PSW 121-132)	HSJFP	P03	P03	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.332	348.7	1.14E-13	6.82E-13				
C09	Anti-cross talk ground wires.	HSJFP	P03	P03	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.332	348.7	0.00E+00	0.00E+00				
C09	Bolometer signals from JFP (PSW 133-144)	HSJFP	P04	P04	24	3			500	5.00E-10	0.1667	2	H12-4032	SST	0.918	0	7.528	113.6	1.34	347.8	1.14E-13	6.82E-13				
C09	Anti-cross talk ground wires.	HSJFP	P04	P04	12	0			500	0.00E+00	0.1667	1	H12-4032	SST	0.459	0	3.764	113.6	1.34	347.8	0.00E+00	0.00E+00				
	Sum Bundle 09														5.508	0	45.168				4.54E-13	2.73E-12				
C10	Sorption Pump Heater	HSFPU	P19	P19	4	0			10	6.30E-03	0.0100	4	H04030	BRASS	0	0.816	2.048	1.4	1.799	2.5	7.5	2.22E-03	1.33E-02	2.22E-01		
C10	Heat switch heaters	HSFPU	P19	P19	8	0			50	3.80E-04	0.0100	2	H04030	BRASS	0	0.408	1.024	1.4	1.799	2.5	47.5	1.62E-05	9.70E-05	1.62E-03		
C10	Various cooler thermistors	HSFPU	P19	P19	20	5			1000	1.00E-06	0.3333	5	H04138	SST	0.72	0	4.810	113.6	1.799	204.4	795.6	7.57E-07	4.54E-06	4.54E-06		
C10	Spectrometer Stimulus Thermistors	HSFPU	P21	P21	12	3			1000	1.00E-06	0.3333	3	H04138	SST	0.432	0	2.886	113.6	1.782	202.4	797.6	4.54E-07	2.73E-06			
C10	Spectrometer Stimulus Heater 4%	HSFPU	P21	P21	4	0	10		30	2.30E-03	0.1667	1	H04030	BRASS	0	0.204	0.512	1.4	1.782	2.5	27.5	4.94E-03	2.96E-02			
C10	Spectrometer Stimulus Heater 2%	HSFPU	P21	P21	4	0			30	1.80E-03	0.1667	1	H04030	BRASS	0	0.204	0.512	1.4	1.782	2.5	27.5	3.02E-03	1.81E-02			
C10	FPU Thermometry	HSFPU	P23	P23	24	6			1000	1.00E-06	0.3333	6	H04138	SST	0.864	0	5.772	113.6	1.816	206.3	793.7	9.09E-07	5.45E-06	5.45E-06		
C10	300mK Thermal Control Heater	HSFPU	P23	P23	4	1			30	5.00E-04	0.1667	1	H04138	BRASS	0.124	0.204	1.767	1.4	1.816	2.5	27.5	2.33E-04	1.40E-03			
C10	Vane Position Sensor	HSFPU	P23	P23	2	1			1000	0.00E+00	0.0000	1	H02138	SST	0.088	0	0.771	113.6	1.816	206.3	793.7	0.00E+00				
	Sum Bundle 10														2.228	1.856	20.102				0.010437	0.062623	0.013446			
C11	BSM Chopper Sensors	HSFPU	P25	P25	3	1			1000	1.00E-06	0.1300	1	H03138	SST	0.1	0	0.856	113.6	1.81	205.6	794.4	4.43E-08	2.66E-07	2.66E-07	3.41E-07	
C11	BSM Chopper Sensors	HSFPU	P25	P25	2	1			1000	1.00E-06	0.1300	1	H02138	SST	0.088	0	0.771	113.6	1.81	205.6	794.4	2.95E-08	1.77E-07	1.77E-07	2.27E-07	
C11	BSM Jiggle Sensors	HSFPU	P25	P25	3	1			1000	1.00E-06	0.1300	1	H03138	SST	0.1	0	0.856	113.6	1.81	205.6	794.4	4.43E-08	2.66E-07	2.66E-07	3.41E-07	
C11	BSM Jiggle Sensors	HSFPU	P25	P25	2	1			1000	1.00E-06	0.1300	1	H02138	SST	0.088	0	0.771	113.6	1.81	205.6	794.4	2.95E-08	1.77E-07	1.77E-07	2.27E-07	
C11	BSM Temperature	HSFPU	P25	P25	4	1			1000	1.00E-06	0.3333	1	H04138	SST	0.144	0	0.962	113.6	1.81	205.6	794.4	1.51E-07	9.09E-07	9.09E-07	4.54E-07	
C11	Photometer Stimulus Heater	HSFPU	P25	P25	4	1			10	1.80E-03	0.0200	1	H04138	BRASS	0.124	0.204	1.767	1.4	1.81	2.5	7.5	3.63E-04	2.18E-03	2.18E-03	1.81E-02	
C11	BSM Launch latch sense	HSFPU	P25	P25	2	1			1000	0	0.0000	1	H02138	SST	0.088	0	0.771	113.6	1.81	205.6	794.4	0.00E+00	0.00E+00			
C11	BSM Launch latch solenoid	HSFPU	P25	P25	2	1			10	0	0.0000	1	H02138	BRASS	0.106	0.102	1.340	1.4	1.81	2.5	7.5	0.00E+00	0.00E+00	0.00E+00		
C11	BSM Chop motor drive	HSFPU	P25	P25	4	1			10	1.00E-02	0.1300	1	H04138	BRASS	0.124	0.204	1.767	1.4	1.81	2.5	7.5	7.28E-02	4.37E-01	4.37E-01	5.60E-01	
C11	BSM Jiggle motor drive	HSFPU	P25	P25	4	1			10	2.50E-03	0.1300	1	H04138	BRASS	0.124	0.204	1.767	1.4	1.81	2.5	7.5	4.55E-03	2.73E-02	2.73E-02	3.50E-02	
C11	SMEC Thermometry	HSFPU	P27	P27	8	2			1000	1.00E-06	0.3333	2	H04138	SST	0.288	0	1.924	113.6	1.794	203.8	796.2	3.03E-07	1.82E-06	1.82E-06		
C11	SMEC LVDT Primary	HSFPU	P27	P27	2	1			5	3.54E-03	0.1667	1	H02138	BRASS	0.106	0.102	1.340	1.4	1.794	2.5	5.85E-03	3.51E-02				
C11	SMEC LVDT Secondaries	HSFPU	P27	P27	4	2	11		50	3.54E-05	0.1667	2	H02138	BRASS	0.212	0.204	2.680	1.4	1.794	2.5	47.5	1.17E-06	7.02E-06			
C11	SMEC Launch Latch 1+2	HSFPU	P27	P27	4	2			5	0.00E+00	0.0000	2	H02138	BRASS	0.212	0.204	2.680	1.4	1.794	2.5	2.5	0.00E+00	0.00E+00			
C11	SMEC Launch Latch 1+2 (Rob.)	HSFPU	P27	P27	4	2			5	0.00E+00	0.0000	2	H02138	BRASS	0.212	0.204	2.680	1.4	1.794	2.5	2.5	0.00E+00	0.00E+00			
C11	SMEC Launch Latch 1+2 Sense	HSFPU	P27	P27	4	2			5	0.00E+00	0.0000	2	H02138	BRASS	0.212	0.204	2.680	1.4	1.794	2.5	2.5	0.00E+00	0.00E+00			

Cable_n	Designation		no_of_wires	no_of_shd's	Bundle_no. SIH-CS-xx	Upper chain	R_max (Ohm) at 300 K	I_nominal (A)	Duty_Cycle	no_of_cable	cable_types	Cable						CVV int.Harness CVV-I/F-CB to CFU's					P_ei avg.(mW/m)	P_ei Spec on (mW/m)	P_ei Photon (mW/m)	P_ei peak (mW/m)	Remarks
	Description	Unit										Connector	condu.	SST [mm²]	Brass [mm²]	Insulation [mm²]	R_core Ohm/m at 300 K	Harness lth (mm)	R_max (Ohm)	delta R (Ohm)	R_max (Ohm)	R_max (Ohm)					
C11	SMEC Drive Coil	HSFPU	P29	2	1		5	4.00E-02	0.1667	1	H02130	BRASS	0.106	0.102	1.340	1.4	1.795	2.5	2.5	7.47E-01	4.48E+00						
C11	SMEC Drive (Rob.)	HSFPU	P29	2	1		5	4.00E-02	0.1667	1	H02130	BRASS	0.106	0.102	1.340	1.4	1.795	2.5	2.5	7.47E-01	4.48E+00						
C11	SMEC Drive coil voltage sensor	HSFPU	P29	2	1		500	1.00E-05	0.1667	1	H02138	BRASS	0.08	0.016	0.069	9.0	1.795	16.2	483.8	3.00E-07	1.80E-06						
C11	SMEC Position sensor supplies	HSFPU	P29	2	1		100	1.00E-03	0.1667	1	H02138	BRASS	0.08	0.016	0.069	9.0	1.795	16.2	83.8	3.00E-03	1.80E-02						
C11	SMEC LED Power	HSFPU	P29	2	1		100	8.00E-04	0.1667	1	H02138	BRASS	0.08	0.016	0.069	9.0	1.795	16.2	83.8	1.92E-03	1.15E-02						
C11	SMEC Position sensor photodiodes	HSFPU	P29	6	3		1000	2.00E-05	0.1667	3	H02138	SST	0.264	0	2.313	113.6	1.795	203.9	796.1	4.54E-05	2.73E-04						
C11	SMEC Position sensor photodiodes FB	HSFPU	P29	6	3		1000	1.00E-05	0.1667	3	H02138	SST	0.264	0	2.313	113.6	1.795	203.9	796.1	1.14E-05	6.82E-05						
	Sum Bundle 11												3.308	1.884	33.1253					1.582174	9.493044	0.466281					
C12	Sorption Pump Heater	HSFPU	P20	4	0		10	0.00E+00	0.0100	4	H04030	BRASS	0	0.816	2.048	1.4	1.671	2.3	7.7	0.00E+00							Redundant to C10
C12	Heat switch heaters	HSFPU	P20	8	0		50	0.00E+00	0.0100	2	H04030	BRASS	0	0.408	1.024	1.4	1.671	2.3	47.7	0.00E+00							Redundant to C10
C12	Various cooler thermistors	HSFPU	P20	20	5		1000	0.00E+00	0.3333	5	H04138	SST	0.72	0	4.810	113.6	1.654	189.8	810.2	0.00E+00							Redundant to C10
C12	Spectrometer Stimulus Thermistors	HSFPU	P22	12	3		1000	0.00E+00	0.3333	3	H04138	SST	0.432	0	2.886	113.6	1.654	187.9	812.1	0.00E+00							Redundant to C10
C12	Spectrometer Stimulus Heater 4%	HSFPU	P22	4	0	07	30	0.00E+00	0.1667	1	H04030	BRASS	0	0.204	0.512	1.4	1.654	2.3	27.7	0.00E+00							Redundant to C10
C12	Spectrometer Stimulus Heater 2%	HSFPU	P22	4	0		30	0.00E+00	0.1667	1	H04030	BRASS	0	0.204	0.512	1.4	1.654	2.3	27.7	0.00E+00							Redundant to C10
C12	FPU Thermometry	HSFPU	P24	24	6		1000	0.00E+00	0.3333	6	H04138	SST	0.864	0	5.772	113.6	1.687	191.6	808.4	0.00E+00							Redundant to C10
C12	300mK Thermal Control Heater	HSFPU	P24	4	1		30	0.00E+00	0.1667	1	H04130	BRASS	0.124	0.204	1.767	1.4	1.687	2.4	27.6	0.00E+00							Redundant to C10
C12	Vane Position Sensor	HSFPU	P24	2	1		1000	0.00E+00	0.0000	1	H02138	SST	0.088	0	0.771	113.6	1.687	191.6	808.4	0.00E+00							Redundant to C10
	Sum Bundle 12												2.228	1.836	20.102					0	0	0					
C13	BSM Chopper Sensors	HSFPU	P26	3	1		1000	0.00E+00	0.1300	1	H03138	SST	0.1	0	0.856	113.6	1.895	215.3	784.7	0.00E+00							Redundant to C11
C13	BSM Chopper Sensors	HSFPU	P26	2	1		1000	0.00E+00	0.1300	1	H02138	SST	0.088	0	0.771	113.6	1.895	215.3	784.7	0.00E+00							Redundant to C11
C13	BSM Jiggle Sensors	HSFPU	P26	3	1		1000	0.00E+00	0.1300	1	H03138	SST	0.1	0	0.856	113.6	1.895	215.3	784.7	0.00E+00							Redundant to C11
C13	BSM Jiggle Sensors	HSFPU	P26	2	1		1000	0.00E+00	0.1300	1	H02138	SST	0.088	0	0.771	113.6	1.895	215.3	784.7	0.00E+00							Redundant to C11
C13	BSM Temperature	HSFPU	P26	4	1		1000	0.00E+00	0.3333	1	H04138	SST	0.144	0	0.962	113.6	1.895	215.3	784.7	0.00E+00							Redundant to C11
C13	Photometer Stimulus Heater	HSFPU	P26	4	1		10	0.00E+00	0.0200	1	H04130	BRASS	0.124	0.204	1.767	1.4	1.895	2.7	7.3	0.00E+00							Redundant to C11
C13	BSM Launch latch sense	HSFPU	P26	2	1		1000	0.00E+00	0.0000	1	H02138	SST	0.088	0	0.771	113.6	1.895	215.3	784.7	0.00E+00							Redundant to C11
C13	BSM Launch latch solenoid	HSFPU	P26	2	1		10	0.00E+00	0.0000	1	H02130	BRASS	0.102	0.102	1.340	1.4	1.895	2.7	7.3	0.00E+00							Redundant to C11
C13	BSM Chop motor drive	HSFPU	P26	4	1		10	0.00E+00	0.1300	1	H04130	BRASS	0.124	0.204	1.767	1.4	1.895	2.7	7.3	0.00E+00							Redundant to C11
C13	BSM Jiggle motor drive	HSFPU	P26	4	1		10	0.00E+00	0.1300	1	H04130	BRASS	0.124	0.204	1.767	1.4	1.895	2.7	7.3	0.00E+00							Redundant to C11
C13	SMEC Thermometry	HSFPU	P28	8	2		1000	0.00E+00	0.3333	2	H04138	SST	0.288	0	1.924	113.6	1.88	213.6	786.4	0.00E+00							Redundant to C11
C13	SMEC LVDT Primary	HSFPU	P28	2	1		5	0.00E+00	0.1667	1	H02130	BRASS	0.106	0.102	1.340	1.4	1.88	2.6	2.4	0.00E+00							Redundant to C11
C13	SMEC LVDT Secondaries	HSFPU	P28	4	2		50	0.00E+00	0.1667	2	H02130	BRASS	0.212	0.204	2.680	1.4	1.88	2.6	47.4	0.00E+00							Redundant to C11
C13	SMEC Launch Latch 1+2	HSFPU	P28	4	2		5	0.00E+00	0.0000	2	H02130	BRASS	0.212	0.204	2.680	1.4	1.88	2.6	2.4	0.00E+00							Redundant to C11
C13	SMEC Launch Latch 1+2 (Rob.)	HSFPU	P28	4	2		5	0.00E+00	0.0000	2	H02130	BRASS	0.212	0.204	2.680	1.4	1.88	2.6	2.4	0.00E+00							Redundant to C11
C13	SMEC Launch Latch 1+2 Sense	HSFPU	P28	4	2		5	0.00E+00	0.0000	2	H02130	BRASS	0.212	0.204	2.680	1.4	1.88	2.6	2.4	0.00E+00							Redundant to C11
C13	SMEC Drive Coil	HSFPU	P30	2	1		5	0.00E+00	0.1667	1	H02130	BRASS	0.106	0.102	1.340	1.4	1.88	2.6	2.4	0.00E+00							Redundant to C11
C13	SMEC Drive (Rob.)	HSFPU	P30	2	1		5	0.00E+00	0.1667	1	H02130	BRASS	0.106	0.102	1.340	1.4	1.88	2.6	2.4	0.00E+00							Redundant to C11
C13	SMEC Drive coil voltage sensor	HSFPU	P30	2	1		500	0.00E+00	0.1667	1	H02138	BRASS	0.08	0.016	0.069	9.0	1.88	16.9	483.1	0.00E+00							Redundant to C11
C13	SMEC Position sensor supplies	HSFPU	P30	2	1		100	0.00E+00	0.1667	1	H02138	BRASS	0.08	0.016	0.069	9.0	1.88	16.9	83.1	0.00E+00							Redundant to C11
C13	SMEC LED Power	HSFPU	P30	2	1		100	0.00E+00	0.1667	1	H02138	BRASS	0.08	0.016	0.069	9.0	1.88	16.9	83.1	0.00E+00							Redundant to C11
C13	SMEC Position sensor photodiodes	HSFPU	P30	6	3		1000	0.00E+00	0.1667	3	H02138	SST	0.264	0	2.313	113.6	1.88	213.6	786.4	0.00E+00							Redundant to C11
C13	SMEC Position sensor photodiodes FB	HSFPU	P30	6	3		1000	0.00E+00	0.1667	3	H02138	SST	0.264	0	2.313	113.6	1.88	213.6	786.4	0.00E+00							Redundant to C11
	Sum Bundle 13												3.304	1.884	33.1253					0.00E+00	0	0					
	Sum Bundles 01 - 02: SP-JFET												10.406	0.594	92.346					1.10E-02	6.58E-02	3.11E-01					
	Sum Bundles 03 - 09: PH-JFET												37.24	0.847	318.739					5.19E-02	9.56E+00	4.80E-01					
	Sum Bundles 10 - 13: SPIRE FPU												11.068	7.44	106.4546					1.59E+00	9.56E+00	4.80E-01					

	Name	Dep./Comp.		Name	Dep./Comp.
	Alberti von Mathias Dr.	SM 34		Schweickert Gunn	SM 34
1	Alo Hakan	OTN/LP 45	1	Stauss Oliver	SM 33
	Barlage Bernhard	ED 11	1	Steininger Eric	ED 422
	Bayer Thomas	ED 541	X	Stritter Rene	ED 11
1	Faas Horst	EA 65		Tenhaeff Dieter	SM 34
1	Fehringer Alexander	SM 33		Thörmer Klaus-Horst Dr.	OTN/ED 65
	Frey Albrecht	ED 422		Wagner Adalbert	OTN/LP 45
1	Gemer Willi	ED 11	1	Wagner Klaus	SM 31
1	Grasl Andreas	OTN/EN 64	X	Wietbrock, Walter	ED 521
	Grasshoff Brigitte	ED 521		Wöhler Hans	SM 34
	Hartmann Hans Dr.	ED 422		Gareisen Ferdinand	OTN/LP 45
1	Hauser Armin	SM 31	1	Schebitz Anja	OTN/LP 45
	Hinger Jürgen	SM 31			
1	Hohn Rüdiger	ED 541	X	Alcatel	ASP
1	Hölzle Edgar	ED 421	1	ESA/ESTEC	ESA
	Huber Johann	ED 543		Instruments:	
1	Hund Walter	SE 76	X	MPE (PACS)	MPE
1	Idler Siegmund	ED 432	X	RAL (SPIRE)	RAL
	Ivány von András	ACE 32	1	SRON (HIFI)	SRON
X	Jahn Gerd Dr.	SM 31		Subcontractors:	
1	Kalde Clemens	ED 532		Air Liquide, Space Department	AIR
1	Kameter Rudolf	OTN/EN 64		Air Liquide, Space Department	AIRS
	Kersting Stefan	OTN/EN 63		Air Liquide, Orbital System	AIRT
1	Kettner Bernhard	SM 34		Alcatel Bell Space	ABSP
1	Knoblauch August	ED 531		Astrium Sub-Subsyst. & Equipment	ASSE
1	Koelle Markus	ED 523		Austrian Aerospace	AAE
1	Kroeker Jürgen	ED 542		Austrian Aerospace	AAEM
	Kunz Oliver	SM 31		APCO Technologies S. A.	APCO
	Lamprecht Ernst	OTN/SM 222		Bieri Engineering B. V.	BIER
1	Lang Jürgen	SE 76		BOC Edwards	BOCE
	Langfermann Michael	ED 541		Dutch Space Solar Arrays	DSSA
	Mack Paul	OTN/EN 64	X	EADS CASA Espacio	CASA
	Muhl Eckhard	OTN/EN 64		EADS CASA Espacio	ECAS
1	Pastorino Michel	ASPI Resid.	1	EADS Space Transportation	ASIP
	Peitzker Helmut	ED 65		Eurocopter	ECD
	Peltz Heinz-Willi	SM 33		HTS AG Zürich	HTSZ
	Pietroboni Karin	ED 65		Linde	LIND
	Puttlitz Joachim	OTN/EN 64		Patria New Technologies Oy	PANT
	Rebholz Reinhold	ED 541		Phoenix, Volkmarsen	PHOE
1	Reuß Friedhelm	ED 62		Prototech AS	PROT
1	Rühe Wolfgang	ED 65		QMC Instruments Ltd.	QMC
	Runge Axel	OTN/EN 64		Rembe, Brilon	REMB
	Sachsse Bernt	ED 21		SENER Ingenieria SA	SEN
	Schäffler Johannes	OTN/EN 64		Stöhr, Königsbrunn	STOE
1	Schink Dietmar	ED 422		Rosemount Aerospace GmbH	ROSE
1	Schlosser Christian	OTN/EN 64			
	Schmidt Rudolf	ACE 32		RYMSA, Radiación y Microondas S.A.	RYM