ORIGINALE ARCHIVIO

CARLO GAVAZZI CARLO GAVAZZI SPACE SpA	**AMS02 TCS**	AMSTCS-RP-CGS-017 ISSUE : 1 DATE: 02.11.2009 PAGE : 1 of 1 + ANNEX A + B

INSPECTION REPORT

APPLICABLE DOC. REF.	PROC. REF. N.A.

ITEM INSPECTED (Name, P/N, S/N)

RAM Radiator P/N : 41-AMS02TCS-200.00.00 S/N : 01

REQUIREMENT SATISFIED

Manufacturing according to aerospace standards

INSPECTION (Action/Results)

RAM RADIATOR Cabling Electrical check-out Report

On 02.11.2009 the RAM Radiator (P/N 41-AMS02TCS-200.00.00) has been inspected and found complete and ready for the integration activities required.

All the Heaters , Thermostats and Connector Brackets have been installed according to the drawing 41-AMS02TCS-200.00.00 Rev. / . and the cabling have been checked and tested according to the document 41-AMS02TCS-200.00.07 Rev. / .

The cables continuity test and the heater resistance test have been performed and the results have been reported in the annexed as-run document . 41-AMS02TCS-200.00.07 Rev. / .

The RAM Radiator has been cleaned with Isopropyl alcohol before been packed and sent to the CERN facilities.

Signature and Date	02. 11. 2009	[signature] L. CREMONESI	C. CINQUEPALMI [signature]
	Operator	Quality Assurance	Configuration Control

INTERNAL CABLING Annex A to AMS TCS-RP-CGS-01 R

REV.	DRAWN BY - DATE	MEC. CHECK - DATE	ELEC. CHECK - DATE	SYS. CHECK - DATE	P.A. CHECK - DATE	C. of C. CHECK - DATE	CHANGE AUTHORITY
/	B.SCOTTI 04/05/09		A. DELL'ACQUA	04.08.09 C. VETTORE	04.08.09	C. CINQUEPALMI 04/09/09	

DRAWING TITLE

AMS TCS

Ram Heaters Thermostats cabling

CARLO GAVAZZI SPACE S.p.A.

15/10/09

FILE NAME	NEXT ASSY	DRAWING NUMBER	REV.
41-AMS02TCS-200.00.07.xls	41-AMS02TCS-200.00.00	41-AMS02TCS-200.00.07	/

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CABLING INFORMATION

IDENTIFICATION PARTS			REQUIREMENTS / TEST	
Item	DESCRIPTION	PART NUMBER	REQUIREMENTS	ACCORDING TO
TB1/6A	Terminal junction module 2x10 contact	M81714/7-DB1		
TB1/6B	Terminal junction module 2x10 contact	M81714/7-DB1		
TB7/11A	Terminal junction module 2x10 contact	M81714/7-DB1	**1) MANUFACTURING**	
TB7/11B	Terminal junction module 2x10 contact	M81714/7-DB1	1.1) SOLDER AND JOINT	ECSS-Q-70-08A
TB1A	Terminal junction module 2x5 contact	M81714/2-DB1	1.2)GENERAL ASSEMBLY	41-AMS02TCS-200.00.00 REV./
TB1B	Terminal junction module 2x5 contact	M81714/2-DB1	1.3)HARNESS ROUTING	
TB2A	Terminal junction module 2x5 contact	M81714/2-DB1	1.4) HEATER GLUING	21-AMS-000.99.00 REV./
TB2B	Terminal junction module 2x5 contact	M81714/2-DB1	**2) CRIMPING TEST**	
TB3A	Terminal junction module 2x5 contact	M81714/2-DB1		
TB3B	Terminal junction module 2x5 contact	M81714/2-DB1		
TB4A	Terminal junction module 2x5 contact	M81714/2-DB1	**3) TEST RETENTION**	N.A.
TB4B	Terminal junction module 2x5 contact	M81714/2-DB1		
TB5A	Terminal junction module 2x5 contact	M81714/2-DB1		
TB5B	Terminal junction module 2x5 contact	M81714/2-DB1		
TB6A	Terminal junction module 2x5 contact	M81714/2-DB1	**4) ELECTRICAL TEST**	N.A.
TB6B	Terminal junction module 2x5 contact	M81714/2-DB1		
J122	Circolar connector	MS27497E10F98P		
	Backshell	M85049/49-2-10N		
J123	Circolar connector	MS27497E10F98PA		
	Backshell	M85049/49-2-10N		
J222	Circolar connector	MS27497E10F98P		
	Backshell	M85049/49-2-10N		
J223	Circolar connector	MS27497E10F98PA		
	Backshell	M85049/49-2-10N		

INTERNAL CABLING

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/	B.SCOTTI 04/05/09						

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AMS TCS

Ram Heaters Thermostats cabling

CARLO GAVAZZI SPACE S.p.A.

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CABLING INFORMATION

IDENTIFICATION PARTS			REQUIREMENTS / TEST	
HR1/1	Heater	1EFISG440001		
HR1/2	Heater	1EFISG440001		
HR1/3	Heater	MOUNT ON JPD SIDE WALL		
HR1/4	Heater	MOUNT ON JPD SIDE WALL		
HR2/1	Heater	MOUNT ON JT SIDE WALL		
HR2/2	Heater	MOUNT ON JT SIDE WALL		
HR3/1	Heater	MOUNT ON J SIDE WALL		
HR3/2	Heater	MOUNT ON JSIDE WALL		
HR4/1	Heater	1EFISG435001		
HR4/2	Heater	1EFISG435001		
HR5/1	Heater	1EFISG435001		
HR5/2	Heater	1EFISG435001		
HR5/3	Heater	1EFISG435001		
HR6/1	Heater	1EFISG435001		
HR6/2	Heater	1EFISG435001		
HR6/3	Heater	1EFISG435001		
HR7/1	Heater	1EFISG435001		
HR7/2	Heater	1EFISG435001		
HR8/1	Heater	1EFISG435001		
HR8/2	Heater	1EFISG435001		
HR9/1	Heater	1EFISG435001		
HR9/2	Heater	1EFISG435001		
HR10/1	Heater	1EFISG435001		
HR10/2	Heater	1EFISG435001		
HR11/1	Heater	1EFISG435001		

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AMS TCS

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CABLING INFORMATION

IDENTIFICATION PARTS			REQUIREMENTS / TEST		
TH1/1A	Thermostat	G311P641/03706S018A032/3/3/8	D/C 0808	S/N 223	
TH1/2A	Thermostat	G311P641/03706S018A032/3/3/8		216	
TH1/1B	Thermostat	G311P641/03706S018A032/3/3/8		235	
TH1/2B	Thermostat	G311P641/03706S018A032/3/3/8		211	
TH2/1A	Thermostat	G311P641/03706S018A032/3/3/8		227	
TH2/2A	Thermostat	G311P641/03706S018A032/3/3/8		202	
TH2/1B	Thermostat	G311P641/03706S018A032/3/3/8		249	
TH2/2B	Thermostat	G311P641/03706S018A032/3/3/8		244	
TH3/1A	Thermostat	G311P641/03706S018A032/3/3/8		252	
TH3/2A	Thermostat	G311P641/03706S018A032/3/3/8		238	
TH3/1B	Thermostat	G311P641/03706S018A032/3/3/8		201	
TH3/2B	Thermostat	G311P641/03706S018A032/3/3/8		253	
TH4/1A	Thermostat	G311P641/03706S018A032/3/3/8		254	
TH4/2A	Thermostat	G311P641/03706S018A032/3/3/8		232	
TH4/1B	Thermostat	G311P641/03706S018A032/3/3/8		208	
TH4/2B	Thermostat	G311P641/03706S018A032/3/3/8		214	
TH5/1A	Thermostat	G311P641/03706S018A032/3/3/8		243	
TH5/2A	Thermostat	G311P641/03706S018A032/3/3/8		210	
TH5/1B	Thermostat	G311P641/03706S018A032/3/3/8		233	
TH5/2B	Thermostat	G311P641/03706S018A032/3/3/8		247	
TH6/1A	Thermostat	G311P641/03706S018A032/3/3/8		241	
TH6/2A	Thermostat	G311P641/03706S018A032/3/3/8		222	
TH6/1B	Thermostat	G311P641/03706S018A032/3/3/8		246	
TH6/2B	Thermostat	G311P641/03706S018A032/3/3/8		248	
TH7/1A	Thermostat	G311P641/03706S018A032/3/3/8		221	

INTERNAL CABLING

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/	B.SCOTTI 04/05/09						

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AMS TCS

Ram Heaters Thermostats cabling

CARLO GAVAZZI SPACE S.p.A.

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41-AMS02TCS-200.00.07.xls	41-AMS02TCS-200.00.00	41-AMS02TCS-200.00.07	/

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CABLING INFORMATION

IDENTIFICATION PARTS			REQUIREMENTS / TEST	
TH7/2A	Thermostat	G311P641/03706S018A032/3/3/8	D/C 0803 S/N 217	
TH7/1B	Thermostat	G311P641/03706S018A032/3/3/8	208	
TH7/2B	Thermostat	G311P641/03706S018A032/3/3/8	215	
TH8/1A	Thermostat	G311P641/03706S018A032/3/3/8	205	
TH8/2A	Thermostat	G311P641/03706S018A032/3/3/8	242	
TH8/1B	Thermostat	G311P641/03706S018A032/3/3/8	212	
TH8/2B	Thermostat	G311P641/03706S018A032/3/3/8	226	
TH9/1A	Thermostat	G311P641/03706S018A032/3/3/8	245	
TH9/2A	Thermostat	G311P641/03706S018A032/3/3/8	234	
TH9/1B	Thermostat	G311P641/03706S018A032/3/3/8	236	
TH9/2B	Thermostat	G311P641/03706S018A032/3/3/8	230	
TH10/1A	Thermostat	G311P641/03706S018A032/3/3/8	256	
TH10/2A	Thermostat	G311P641/03706S018A032/3/3/8	240	
TH10/1B	Thermostat	G311P641/03706S018A032/3/3/8	204	
TH10/2B	Thermostat	G311P641/03706S018A032/3/3/8	251	
TH11/1A	Thermostat	G311P641/03706S018A032/3/3/8	238	
TH11/2A	Thermostat	G311P641/03706S018A032/3/3/8	207	
TH11/1B	Thermostat	G311P641/03706S018A032/3/3/8	220	
TH11/2B	Thermostat	G311P641/03706S018A032/3/3/8	213	

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CONNECTION IDENTIFICATION DATA

002

FROM TB1/6A			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB1/6A	REMARKS	J122	TH3/1 A	TH3/2 A	TH5/1 A	TH5/2 A				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
A H_out2	A / 1	2) - 8)	B								1) - 8)	6	TP AWG 20	TP1	
A H_out2	B / 1	2) - 8)	C								1) - 8)	6	TP AWG 20	TP2	
A H_out2	C / 1	2) - 8)	D								1) - 8)	6	TP AWG 20	TP3	
A H_out2	D / 1	2) - 8)		2A							3) - 8)	6	TP AWG 20	TP63	
A H_out2	E / 1	2) - 8)				2A					3) - 8)	6	TP AWG 20	TP53	
A H_out2 rtn	F / 1	2) - 8)	A								1) - 8)	6	TP AWG 20	TP1	
A H_out2 rtn	G / 1	2) - 8)	E								1) - 8)	6	TP AWG 20	TP3	
A H_out2 rtn	H / 1	2) - 8)	F								1) - 8)	6	TP AWG 20	TP2	
A H_out2 rtn	J / 1	2) - 8)			2A						3) - 8)	6	TP AWG 20	TP63	
A H_out2 rtn	K / 1	2) - 8)					2A				3) - 8)	6	TP AWG 20	TP53	
	A / 2														
	B / 2														
	C / 2														
	D / 2														
	E / 2														
	F / 2														
	G / 2														
	H / 2														
	J / 2														
	K / 2														

DRAWING TITLE

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Ram Heaters Thermostats cabling

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CONNECTION IDENTIFICATION DATA

FROM TB1/6A			TO									WIRE / CABLE INFORMATION			
	TB1/6A	REMARKS	TH4/1 A	TH4/2 A	TH6/1 A	TH6/2 A	TH2/1 A	TH2/2 A	TH1/1 A	TH1/2 A	REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
	A / 1														
	B / 1														
	C / 1														
	D / 1														
	E / 1														
	F / 1														
	G / 1														
	H / 1														
	J / 1														
	K / 1														
A H_out2	A / 2	2) - 8)	2 ✓												
A H_out2	B / 2	2) - 8)			2						3) - 8)	6	TP AWG 20	TP43	
A H_out2	C / 2	2) - 8)					2				3) - 8)	6	TP AWG 20	TP35	
A H_out2	D / 2	2) - 8)							2		3) - 8)	6	TP AWG 20	TP27	
N.C.	E / 2										3) - 8)	6	TP AWG 20	TP19	
A H_out2 rtn	F / 2	2) - 8)		2											
A H_out2 rtn	G / 2	2) - 8)				2					3) - 8)	6	TP AWG 20	TP43	
A H_out2 rtn	H / 2	2) - 8)						2			3) - 8)	6	TP AWG 20	TP35	
A H_out2 rtn	J / 2	2) - 8)								2	3) - 8)	6	TP AWG 20	TP27	
N.C.	K / 2										3) - 8)	6	TP AWG 20	TP19	

AMS TCS

Ram Heaters Thermostats cabling

CARLO GAVAZZI SPACE S.p.A.

FILE NAME	NEXT ASSY	PARTS LIST NUMBER	REV.
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CONNECTION IDENTIFICATION DATA

FROM TB1_6B			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB1_6B	REMARKS	J222	TH3/1 B	TH3/2 B	TH5/1 B	TH5/2 B				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
B H_out2	A / 1	2) - 8)	B								1) - 8)	6	TP AWG 20	TP4	
B H_out2	B / 1	2) - 8)	C								1) - 8)	6	TP AWG 20	TP5	
B H_out2	C / 1	2) - 8)	D								1) - 8)	6	TP AWG 20	TP6	
B H_out2	D / 1	2) - 8)		2							3) - 8)	6	TP AWG 20	TP65	
B H_out2	E / 1	2) - 8)				2					3) - 8)	6	TP AWG 20	TP55	
B H_out2 rtn	F / 1	2) - 8)	A								1) - 8)	6	TP AWG 20	TP4	
B H_out2 rtn	G / 1	2) - 8)	E								1) - 8)	6	TP AWG 20	TP5	
B H_out2 rtn	H / 1	2) - 8)	F								1) - 8)	6	TP AWG 20	TP6	
B H_out2 rtn	J / 1	2) - 8)			2						3) - 8)	6	TP AWG 20	TP65	
B H_out2 rtn	K / 1	2) - 8)					2				3) - 8)	6	TP AWG 20	TP55	
	A / 2														
	B / 2														
	C / 2														
	D / 2														
	E / 2														
	F / 2														
	G / 2														
	H / 2														
	J / 2														
	K / 2														

DRAWING TITLE

AMS TCS

Ram Heaters Thermostats cabling

CARLO GAVAZZI SPACE S.p.A.

FILE NAME	NEXT ASSY	PARTS LIST NUMBER	REV
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CONNECTION IDENTIFICATION DATA

FROM TB1_6B			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB1_6B	REMARKS	TH4/1 B	TH4/2 B	TH6/1 B	TH6/2 B	TH2/1 B	TH2/2 B	TH1/1 B	TH1/2 B	REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
	A / 1														
	B / 1														
	C / 1														
	D / 1														
	E / 1														
	F / 1														
	G / 1														
	H / 1														
	J / 1														
	K / 1														
B H_out2	A / 2	2) - 8)	2												
B H_out2	B / 2	2) - 8)			2						3) - 8)	6	TP AWG 20	TP45	
B H_out2	C / 2	2) - 8)					2				3) - 8)	6	TP AWG 20	TP37	
B H_out2	D / 2	2) - 8)							2		3) - 8)	6	TP AWG 20	TP29	
N.C.	E / 2										3) - 8)	6	TP AWG 20	TP21	
B H_out2 rtn	F / 2	2) - 8)		2											
B H_out2 rtn	G / 2	2) - 8)				2					3) - 8)	6	TP AWG 20	TP45	
B H_out2 rtn	H / 2	2) - 8)						2			3) - 8)	6	TP AWG 20	TP37	
B H_out2 rtn	J / 2	2) - 8)								2	3) - 8)	6	TP AWG 20	TP29	
N.C.	K / 2										3) - 8)	6	TP AWG 20	TP21	

DRAWING TITLE

AMS TCS

Ram Heaters Thermostats cabling

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CONNECTION IDENTIFICATION DATA

FROM TB7/11A			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB7/11A	REMARKS	J123	TH9/1 A	TH9/2 A	TH8/1 A	TH8/2 A				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
AH_OUT 5	A / 1	2) - 8)	B								1) - 8)	6	TP AWG 20	TP7	
AH_OUT 5	B / 1	2) - 8)	C								1) - 8)	6	TP AWG 20	TP8	
AH_OUT 5	C / 1	2) - 8)		2							3) - 8)	6	TP AWG 20	TP83	
AH_OUT 5	D / 1	2) - 8)				2					3) - 8)	6	TP AWG 20	TP79	
N.C.	E / 1														
AH_OUT 5 RTN	F / 1	2) - 8)	A								1) - 8)	6	TP AWG 20	TP7	
AH_OUT 5 RTN	G / 1	2) - 8)	F								1) - 8)	6	TP AWG 20	TP8	
AH_OUT 5 RTN	H / 1	2) - 8)			2						3) - 8)	6	TP AWG 20	TP83	
AH_OUT 5 RTN	J / 1	2) - 8)					2				3) - 8)	6	TP AWG 20	TP79	
N.C.	K / 1														
	A / 2														
	B / 2														
	C / 2														
	D / 2														
	E / 2														
	F / 2														
	G / 2														
	H / 2														
	J / 2														
	K / 2														

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CONNECTION IDENTIFICATION DATA

FROM TB7/11A			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB7/11A	REMARKS	TH11/1 A	TH11/2 A	TH10/1 A	TH10/2 A	TH7/1 A	TH7/2 A			REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
	A / 1														
	B / 1														
	C / 1														
	D / 1														
	E / 1														
	F / 1														
	G / 1														
	H / 1														
	J / 1														
	K / 1														
AH_OUT 5	A / 2	2) - 8)	2								3) - 8)	6	TP AWG 20	TP75	
AH_OUT 5	B / 2	2) - 8)			2						3) - 8)	6	TP AWG 20	TP71	
AH_OUT 5	C / 2	2) - 8)					2				3) - 8)	6	TP AWG 20	TP67	
N.C.	D / 2														
N.C.	E / 2														
AH_OUT 5 RTN	F / 2	2) - 8)		2							3) - 8)	6	TP AWG 20	TP75	
AH_OUT 5 RTN	G / 2	2) - 8)				2					3) - 8)	6	TP AWG 20	TP71	
AH_OUT 5 RTN	H / 2	2) - 8)						2			3) - 8)	6	TP AWG 20	TP67	
N.C.	J / 2														
N.C.	K / 2														

DRAWING TITLE

AMS TCS

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CONNECTION IDENTIFICATION DATA

FROM TB7/11B			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB7/11B	REMARKS	J223	TH9/1 B	TH9/2 B	TH8/1 B	TH8/2 B				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
BH_OUT 5	A / 1	2) - 8)	B								1) - 8)	6	TP AWG 20	TP9	
BH_OUT 5	B / 1	2) - 8)	C								1) - 8)	6	TP AWG 20	TP10	
BH_OUT 5	C / 1	2) - 8)		2							3) - 8)	6	TP AWG 20	TP84	
BH_OUT 5	D / 1	2) - 8)				2					3) - 8)	6	TP AWG 20	TP80	
N.C.	E / 1														
N.C.	F / 1														
BH_OUT 5 RTN	G / 1	2) - 8)	F								1) - 8)	6	TP AWG 20	TP10	
BH_OUT 5 RTN	H / 1	2) - 8)			2						3) - 8)	6	TP AWG 20	TP84	
BH_OUT 5 RTN	J / 1	2) - 8)					2				3) - 8)	6	TP AWG 20	TP80	
BH_OUT 5 RTN	K / 1	2) - 8)	A								1) - 8)	6	TP AWG 20	TP9	
	A / 2														
	B / 2														
	C / 2														
	D / 2														
	E / 2														
	F / 2														
	G / 2														
	H / 2														
	J / 2														
	K / 2														

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CONNECTION IDENTIFICATION DATA

FROM TB7/11B			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB7/11B	REMARKS	TH11/1 B	TH11/2 B	TH10/1 B	TH10/2 B	TH7/1 B	TH7/2 B			REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
	A / 1														
	B / 1														
	C / 1														
	D / 1														
	E / 1														
	F / 1														
	G / 1														
	H / 1														
	J / 1														
	K / 1														
BH_OUT 5	A / 2	2) - 8)	2												
BH_OUT 5	B / 2	2) - 8)			2						3) - 8)	6	TP AWG 20	TP76	
BH_OUT 5	C / 2	2) - 8)					2				3) - 8)	6	TP AWG 20	TP72	
N.C.	D / 2										3) - 8)	6	TP AWG 20	TP68	
N.C.	E / 2														
BH_OUT 5 RTN	F / 2	2) - 8)		2											
BH_OUT 5 RTN	G / 2	2) - 8)				2					3) - 8)	6	TP AWG 20	TP76	
BH_OUT 5 RTN	H / 2	2) - 8)						2			3) - 8)	6	TP AWG 20	TP72	
N.C.	J / 2										3) - 8)	6	TP AWG 20	TP68	
N.C.	K / 2														

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CONNECTION IDENTIFICATION DATA

FROM J122			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	J122	REMARKS	TB1/6 A								REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
AH_OUT 2 RTN	A	1)	F/1								2) - 8)	6	TP AWG 20	TP1	
AH_OUT 2	B	1)	A/1								2) - 8)	6	TP AWG 20	TP1	
AH_OUT 2	C	1)	B/1								2) - 8)	6	TP AWG 20	TP2	
AH_OUT 2	D	1)	C/1								2) - 8)	6	TP AWG 20	TP3	
AH_OUT 2 RTN	E	1)	G/1								2) - 8)	6	TP AWG 20	TP3	
AH_OUT 2 RTN	F	1)	H/1								2) - 8)	6	TP AWG 20	TP2	

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CONNECTION IDENTIFICATION DATA

FROM J123			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	J123	REMARKS	TB7/11 A								REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
AH_OUT 5 RTN	A	1)	F/1								2) - 8)	6	TP AWG 20	TP7	
AH_OUT 5	B	1)	A/1								2) - 8)	6	TP AWG 20	TP7	
AH_OUT 5	C	1)	B/1								2) - 8)	6	TP AWG 20	TP8	
N.C.	D	7)													
N.C.	E	7)													
AH_OUT 5 RTN	F	1)	G/1								2) - 8)	6	TP AWG 20	TP8	

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CONNECTION IDENTIFICATION DATA

FROM J222			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	J222	REMARKS	TB1/6 B								REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
BH_OUT 2_RTN	A	1)	F/1								2) - 8)	6	TP AWG 20	TP4	
BH_OUT 2	B	1)	A/1								2) - 8)	6	TP AWG 20	TP4	
BH_OUT 2	C	1)	B/1								2) - 8)	6	TP AWG 20	TP5	
BH_OUT 2	D	1)	C/1								2) - 8)	6	TP AWG 20	TP6	
BH_OUT 2 RTN	E	1)	G/1								2) - 8)	6	TP AWG 20	TP5	
BH_OUT 2 RTN	F	1)	H/1								2) - 8)	6	TP AWG 20	TP6	

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FROM J223			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	J223	REMARKS	TB7/11 B								REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
BH_OUT 5 RTN	A	1)	K/1								2) - 8)	6	TP AWG 20	TP9	
BH_OUT 5	B	1)	A/1								2) - 8)	6	TP AWG 20	TP9	
BH_OUT 5	C	1)	B/1								2) - 8)	6	TP AWG 20	TP10	
N.C.	D														
N.C.	E														
BH_OUT 5 RTN	F	1)	G/1								2) - 8)	6	TP AWG 20	TP10	

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CONNECTION IDENTIFICATION DATA

FROM TB1A			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB1A	REMARKS	HR1/1	HR1/2	HR1/3	HR1/4	TH1/1 A	TH1/2 A			REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 A + 120 V	A	2) - 8)	1								4)		TP AWG 20	TP11	
Out 2 A + 120 V	B	2) - 8)		1							4)		TP AWG 20	TP13	
Out 2 A + 120 V	C	5) - 8)			1						4)		TP AWG 24	TP15	
Out 2 A + 120 V	D	5) - 8)				1					4)		TP AWG 24	TP17	
Out 2 A + 120 V	E	2) - 8)					1				3) - 8)	6	TP AWG 20	TP20	
Out 2 A + 120 V Rtn	F	2) - 8)	2								4)		TP AWG 20	TP11	
Out 2 A + 120 V Rtn	G	2) - 8)		2							4)		TP AWG 20	TP13	
Out 2 A + 120 V Rtn	H	5) - 8)			2						4)		TP AWG 24	TP15	
Out 2 A + 120 V Rtn	J	5) - 8)				2					4)		TP AWG 24	TP17	
Out 2 A + 120 V Rtn	K	2) - 8)						1			3) - 8)	6	TP AWG 20	TP20	

TH1/1A
+ H1/2A

255.5 Ω

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CONNECTION IDENTIFICATION DATA

FROM TB1B			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB1B	REMARKS	HR1/1	HR1/2	HR1/3	HR1/4	TH1/1 B	TH1/2 B			REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 B + 120 V	A	2) - 8)	3								4)		TP AWG 20	TP12	
Out 2 B + 120 V	B	2) - 8)		3							4)		TP AWG 20	TP14	
Out 2 B + 120 V	C	5) - 8)			3						4)		TP AWG 24	TP16	
Out 2 B + 120 V	D	5) - 8)				3					4)		TP AWG 24	TP18	
Out 2 B + 120 V	E	2) - 8)					1				3) - 8)	6	TP AWG 20	TP22	
Out 2 B + 120 V Rtn	F	2) - 8)	4								4)		TP AWG 20	TP12	
Out 2 B + 120 V Rtn	G	2) - 8)		4							4)		TP AWG 20	TP14	
Out 2 B + 120 V Rtn	H	5) - 8)			4						4)		TP AWG 24	TP16	
Out 2 B + 120 V Rtn	J	5) - 8)				4					4)		TP AWG 24	TP18	
Out 2 B + 120 V Rtn	K	2) - 8)						1			3) - 8)	6	TP AWG 20	TP22	

R(1) = 255.1 Ω

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CONNECTION IDENTIFICATION DATA

FROM TB2A			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB2A	REMARKS	HR2/1	HR2/2	TH2/1 A	TH2/2 A					REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 A + 120 V	A	5) - 8)	1								4)		TP AWG 24	TP23	
Out 2 A + 120 V	B	5) - 8)		1							4)		TP AWG 24	TP25	
Spare	C														
Spare	D														
Out 2 A + 120 V	E	2) - 8)			1						3) - 8)	6	TP AWG 20	TP28	
Out 2 A + 120 V Rtn	F	5) - 8)	2								4)		TP AWG 24	TP23	
Out 2 A + 120 V Rtn	G	5) - 8)		2							4)		TP AWG 24	TP25	
Spare	H														
Spare	J														
Out 2 A + 120 V Rtn	K	2) - 8)				1					3) - 8)	6	TP AWG 20	TP28	

R (1) U/L NO RES

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CONNECTION IDENTIFICATION DATA

FROM TB2B			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB2B	REMARKS	HR2/1	HR2/2	TH2/1 B	TH2/2 B					REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 B + 120 V	A	5) - 8)	3								4)		TP AWG 24	TP24	
Out 2 B + 120 V	B	5) - 8)		3							4)		TP AWG 24	TP26	
Spare	C														
Spare	D														
Out 2 B + 120 V	E	2) - 8)			1 ✓						3) - 8)	6	TP AWG 20	TP30	
Out 2 B + 120 V Rtn	F	5) - 8)	4								4)		TP AWG 24	TP24	
Out 2 B + 120 V Rtn	G	5) - 8)		4							4)		TP AWG 24	TP26	
Spare	H														
Spare	J														
Out 2 B + 120 V Rtn	K	2) - 8)				✓					3) - 8)	6	TP AWG 20	TP30	

NOTES

06

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CONNECTION IDENTIFICATION DATA

FROM TB3A			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB3A	REMARKS	HR3/1	HR3/2	TH3/1 A	TH3/2 A					REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 A + 120 V	A	5) - 8)	1								4)		TP AWG 24	TP31	
Out 2 A + 120 V	B	5) - 8)		1							4)		TP AWG 24	TP33	
Spare	C														
Spare	D														
Out 2 A + 120 V	E	2) - 8)			1						3) - 8)	6	TP AWG 20	TP36	
Out 2 A + 120 V Rtn	F	5) - 8)	2								4)		TP AWG 24	TP31	
Out 2 A + 120 V Rtn	G	5) - 8)		2							4)		TP AWG 24	TP33	
Spare	H														
Spare	J														
Out 2 A + 120 V Rtn	K	2) - 8)				1					3) - 8)	6	TP AWG 20	TP36	

NO RJS

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CONNECTION IDENTIFICATION DATA

FROM TB3B			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB3B	REMARKS	HR3/1	HR3/2	TH3/1 B	TH3/2 B					REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 B + 120 V	A	5) - 8)	3								4)		TP AWG 24	TP32	
Out 2 B + 120 V	B	5) - 8)		3							4)		TP AWG 24	TP34	
Spare	C														
Spare	D														
Out 2 B + 120 V	E	2) - 8)									3) - 8)	6	TP AWG 20	TP38	
Out 2 B + 120 V Rtn	F	5) - 8)	4								4)		TP AWG 24	TP32	
Out 2 B + 120 V Rtn	G	5) - 8)		4							4)		TP AWG 24	TP34	
Spare	H														
Spare	J														
Out 2 B + 120 V Rtn	K	2) - 8)				1					3) - 8)	6	TP AWG 20	TP38	

NO RS

Ok

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CONNECTION IDENTIFICATION DATA

FROM TB4A			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB4A	REMARKS	HR4/1	HR4/2	TH4/1 A	TH4/2 A					REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 A + 120 V	A	2) - 8)	1								4)		TP AWG 20	TP39	
Out 2 A + 120 V	B	2) - 8)		1							4)		TP AWG 20	TP41	
Spare	C														
Spare	D														
Out 2 A + 120 V	E	2) - 8)			1						3) - 8)	6	TP AWG 20	TP44	
Out 2 A + 120 V Rtn	F	2) - 8)	2								4)		TP AWG 20	TP39	
Out 2 A + 120 V Rtn	G	2) - 8)		2							4)		TP AWG 20	TP41	
Spare	H														
Spare	J														
Out 2 A + 120 V Rtn	K	2) - 8)				1					3) - 8)	6	TP AWG 20	TP44	

R (1) = 211.3Ω

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CONNECTION IDENTIFICATION DATA

FROM TB4B			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB4B	REMARKS	HR4/1	HR4/2	TH4/1 B	TH4/2 B					REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 B + 120 V	A	2) - 8)	3								4)		TP AWG 20	TP40	
Out 2 B + 120 V	B	2) - 8)		3							4)		TP AWG 20	TP42	
Spare	C														
Spare	D														
Out 2 B + 120 V	E	2) - 8)			1						3) - 8)	6	TP AWG 20	TP46	
Out 2 B + 120 V Rtn	F	2) - 8)	4								4)		TP AWG 20	TP40	
Out 2 B + 120 V Rtn	G	2) - 8)		4							4)		TP AWG 20	TP42	
Spare	H														
Spare	J														
Out 2 B + 120 V Rtn	K	2) - 8)				r					3) - 8)	6	TP AWG 20	TP46	

R 1 = 211.6 Ω

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CONNECTION IDENTIFICATION DATA

FROM TB5A			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB5A	REMARKS	HR5/1	HR5/2	HR5/3	TH5/1 A	TH5/2 A				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 A + 120 V	A	2) - 8)	1								4)		TP AWG 20	TP47	
Out 2 A + 120 V	B	2) - 8)		1							4)		TP AWG 20	TP49	
Out 2 A + 120 V	C	2) - 8)			1						4)		TP AWG 20	TP51	
Spare	D														
Out 2 A + 120 V	E	2) - 8)				Q					3) - 8)		TP AWG 20	TP54	
Out 2 A + 120 V Rtn	F	2) - 8)	2								4)		TP AWG 20	TP47	
Out 2 A + 120 V Rtn	G	2) - 8)		2							4)		TP AWG 20	TP49	
Out 2 A + 120 V Rtn	H	2) - 8)			2						4)		TP AWG 20	TP51	
Spare	J														
Out 2 A + 120 V Rtn	K	2) - 8)					1				3) - 8)		TP AWG 20	TP54	

R 1 = 161.1 Ω

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CONNECTION IDENTIFICATION DATA

FROM TB5B			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB5B	REMARKS	HR5/1	HR5/2	HR5/3	TH5/1 B	TH5/2 B				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 B + 120 V	A	2) - 8)	3								4)		TP AWG 20	TP48	
Out 2 B + 120 V	B	2) - 8)		3							4)		TP AWG 20	TP50	
Out 2 B + 120 V	C	2) - 8)			3						4)		TP AWG 20	TP52	
Spare	D														
Out 2 B + 120 V	E	2) - 8)				1					3) - 8)	6	TP AWG 20	TP56	
Out 2 B + 120 V Rtn	F	2) - 8)	4								4)		TP AWG 20	TP48	
Out 2 B + 120 V Rtn	G	2) - 8)		4							4)		TP AWG 20	TP50	
Out 2 B + 120 V Rtn	H	2) - 8)			4						4)		TP AWG 20	TP52	
Spare	J														
Out 2 B + 120 V Rtn	K	2) - 8)					1				3) - 8)	6	TP AWG 20	TP56	

R (1) = 141.6 Ω

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CONNECTION IDENTIFICATION DATA

FROM TB6A			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB6A	REMARKS	HR6/1	HR6/2	HR6/3	TH6/1 A	TH6/2 A				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 A + 120 V	A	2) - 8)	1								4)		TP AWG 20	TP57	
Out 2 A + 120 V	B	2) - 8)		1							4)		TP AWG 20	TP59	
Out 2 A + 120 V	C	2) - 8)			1						4)		TP AWG 20	TP61	
Spare	D														
Out 2 A + 120 V	E	2) - 8)				1					3) - 8)		TP AWG 20	TP64	
Out 2 A + 120 V Rtn	F	2) - 8)	2								4)		TP AWG 20	TP57	
Out 2 A + 120 V Rtn	G	2) - 8)		2							4)		TP AWG 20	TP59	
Out 2 A + 120 V Rtn	H	2) - 8)			2						4)		TP AWG 20	TP61	
Spare	J														
Out 2 A + 120 V Rtn	K	2) - 8)									3) - 8)		TP AWG 20	TP64	

R 1 = 140.8 Ω

DRAWING TITLE

AMS TCS

Ram Heaters Thermostats cabling

CARLO GAVAZZI SPACE S.p.A.

FILE NAME	NEXT ASSY	PARTS LIST NUMBER	REV
41-AMS02TCS-200.00.07.xls	41-AMS02TCS-200.00.00	41-AMS02TCS-200.00.07	/

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CONNECTION IDENTIFICATION DATA

FROM TB6B			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	TB6B	REMARKS	HR6/1	HR6/2	HR6/3	TH6/1 B	TH6/2 B				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 2 B + 120 V	A	2) - 8)	3								4)		TP AWG 20	TP58	
Out 2 B + 120 V	B	2) - 8)		3							4)		TP AWG 20	TP60	
Out 2 B + 120 V	C	2) - 8)			3						4)		TP AWG 20	TP62	
Spare	D														
Out 2 B + 120 V	E	2) - 8)				1					3) - 8)		TP AWG 20	TP66	
Out 2 B + 120 V Rtn	F	2) - 8)	4								4)		TP AWG 20	TP58	
Out 2 B + 120 V Rtn	G	2) - 8)		4							4)		TP AWG 20	TP60	
Out 2 B + 120 V Rtn	H	2) - 8)			4						4)		TP AWG 20	TP62	
Spare	J														
Out 2 B + 120 V Rtn	K	2) - 8)					1				3) - 8)		TP AWG 20	TP66	

P (1) = 140-8 Ω

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CONNECTION IDENTIFICATION DATA

FROM HR7			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	HR7/1	REMARKS	HR7/2	TH7/1 A	TH7/2 A	TH7/1 B	TH7/2 B				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 5A +120V	1	4) - 6) - 8)	1								4) - 6)		TP AWG 20	TP69	
Out 5A +120V rtn	2	4) - 6) - 8)	2								4) - 6)		TP AWG 20	TP69	
Out 5B +120V	3	4) - 6) - 8)	3								4) - 6)		TP AWG 20	TP70	
Out 5B +120V rtn	4	4) - 6) - 8)	4								4) - 6)		TP AWG 20	TP70	
	HR7/2														
Out 5A +120V	1	4) - 6)		1							3) - 8)	6	TP AWG 20	TP69	
Out 5A +120V rtn	2	4) - 6)			1						3) - 8)	6	TP AWG 20	TP69	
Out 5B +120V	3	4) - 6)				1					3) - 8)	6	TP AWG 20	TP70	
Out 5B +120V rtn	4	4) - 6)					1				3) - 8)	6	TP AWG 20	TP70	

R 1A-2A ~~[illegible]~~ → 157.6 Ω

R 1B-2B 159.2 Ω

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CONNECTION IDENTIFICATION DATA

FROM HR8			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	HR8/1	REMARKS	HR8/2	TH8/1A	TH8/1B	TH8/2A	TH8/2B				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 5A +120V	1	4) - 6) - 8)	1								4) - 6)		TP AWG 20	TP73	
Out 5A +120V rtn	2	4) - 6) - 8)	2								4) - 6)		TP AWG 20	TP73	
Out 5B +120V	3	4) - 6) - 8)	3								4) - 6)		TP AWG 20	TP74	
Out 5B +120V rtn	4	4) - 6) - 8)	4								4) - 6)		TP AWG 20	TP74	
	HR8/2														
Out 5A +120V	1	4) - 6)		1							3) - 8)	6	TP AWG 20	TP73	
Out 5A +120V rtn	2	4) - 6)				1					3) - 8)	6	TP AWG 20	TP73	
Out 5B +120V	3	4) - 6)			1						3) - 8)	6	TP AWG 20	TP74	
Out 5B +120V rtn	4	4) - 6)					1				3) - 8)	6	TP AWG 20	TP74	

TH8 1A - 2A RES 160,2 Ω

1B - 2B RES 160.0 Ω

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CONNECTION IDENTIFICATION DATA

FROM HR9			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	HR9/1	REMARKS	HR9/2	TH9/1A	TH9/1B	TH9/2A	TH9/2B				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 5A +120V	1	4) - 6) - 8)	1								4) - 6)		TP AWG 20	TP77	
Out 5A +120V rtn	2	4) - 6) - 8)	2								4) - 6)		TP AWG 20	TP77	
Out 5B +120V	3	4) - 6) - 8)	3								4) - 6)		TP AWG 20	TP78	
Out 5B +120V rtn	4	4) - 6) - 8)	4								4) - 6)		TP AWG 20	TP78	
	HR9/2														
Out 5A +120V	1	4) - 6)		1							3) - 8)		TP AWG 20	TP77	
Out 5A +120V rtn	2	4) - 6)				1					3) - 8)		TP AWG 20	TP77	
Out 5B +120V	3	4) - 6)			1						3) - 8)		TP AWG 20	TP78	
Out 5B +120V rtn	4	4) - 6)					1				3) - 8)		TP AWG 20	TP78	

R 1A - 2A = 158,5 Ω

Rpn 1B - 2B = 158,7 Ω

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AMS TCS

Ram Heaters Thermostats cabling

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FILE NAME	NEXT ASSY	PARTS LIST NUMBER	REV.
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CONNECTION IDENTIFICATION DATA

FROM HR10			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	HR10/1	REMARKS	HR10/2	TH10/1A	TH10/1B	TH10/2A	TH10/2B				REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 5A +120V	1	4) - 6) - 8)	1								4) - 6)		TP AWG 20	TP81	
Out 5A +120V rtn	2	4) - 6) - 8)	2								4) - 6)		TP AWG 20	TP81	
Out 5B +120V	3	4) - 6) - 8)	3								4) - 6)		TP AWG 20	TP82	
Out 5B +120V rtn	4	4) - 6) - 8)	4								4) - 6)		TP AWG 20	TP82	
	HR10/2														
Out 5A +120V	1	4) - 6)		1							3) - 8)	6	TP AWG 20	TP81	
Out 5A +120V rtn	2	4) - 6)				1					3) - 8)	6	TP AWG 20	TP81	
Out 5B +120V	3	4) - 6)			1						3) - 8)	6	TP AWG 20	TP82	
Out 5B +120V rtn	4	4) - 6)					1				3) - 8)	6	TP AWG 20	TP82	

160,2

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AMS TCS

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CONNECTION IDENTIFICATION DATA

FROM HR11			TO									WIRE / CABLE INFORMATION			
SIGNAL NAME	HR11	REMARKS	TH11/1 A	TH11/2 A	TH11/1 B	TH11/2 B					REMARKS	POS. n°	CABLE TYPE	TWISTED PAIR	REMARKS
Out 5A +120V	1	4)	1								3) - 8)	6	TP AWG 20	TP85	
Out 5A +120V rtn	2	4)		1							3) - 8)	6	TP AWG 20	TP85	
Out 5B +120V	3	4)			1						3) - 8)	6	TP AWG 20	TP86	
Out 5B +120V rtn	4	4)				1					3) - 8)	6	TP AWG 20	TP86	

R 1A - 2A = 324.1 Ω
R 1B - 2B = 317.2 Ω

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Legenda

SW	Single Wire
TP	Twisted pair
TSP	Twisted Shielded pair

TOOLS

"A"	**Hand crimping tool**	CL-51	M22520/01-01	S/N : 773041
	Locator	CL-52	M22520/01-04	Red Position
	Selection Position	3		
"B"	**Hand crimping tool**	CL-1	M22520/01-01	S/N : 55104
	Locator	CL-2	M22520/01-02	Red Position
	Selection Position	4		
"C"	**Hand crimping tool**	CL-49	M22520/01-01	S/N : 791348
	Locator	CL-2	M22520/01-02	Red Position
	Selection Position	2		

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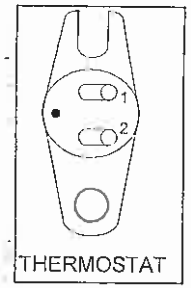
Notes

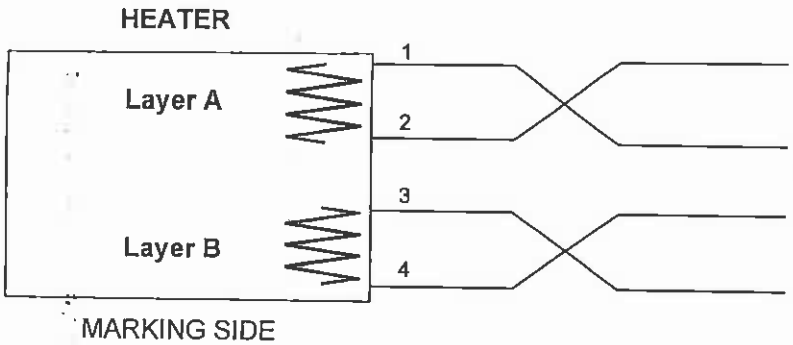
1) CRIMP WIRE TP AWG 20 TO MALE PIN P/N : M39029/58-363 (OF CONNECTOR) USING HAND CRIMPING TOOL "A" .

2) CRIMP WIRE TP AWG 20 TO MALE PIN P/N : M39029/1-101 (OF TERMINAL JUNCTION MODULE) USING HAND CRIMPING TOOL " B ".

3) FOR CONNECTING THE THERMOSTAT SOLDER THE WIRE AWG 20 TP ACCORDING TO ECSS-Q-70-08A AND PROTECT JUNCTION WITH HEAT-SHRINKABLE INSULATE SLEEVE RT-220.



4) FOR CONNECTING THE HEATER SOLDER THE WIRE ACCORDING TO ECSS-Q-70-08A , USE THE WIRE CONNECT OF HEATER .



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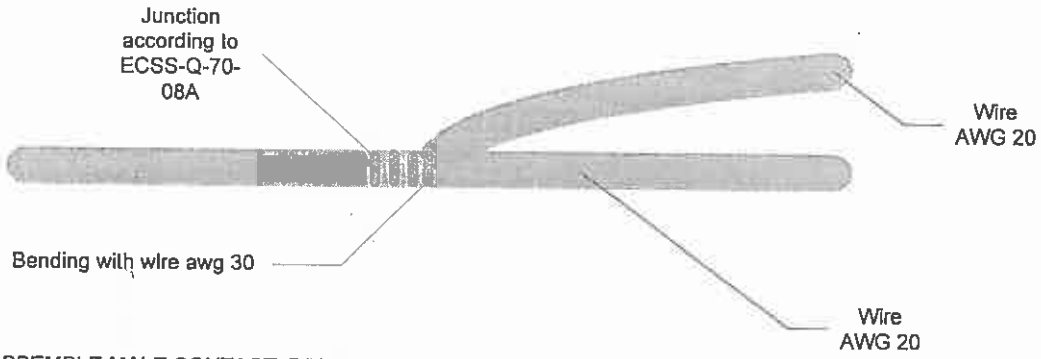
5) CRIMP WIRE TP AWG 24 TO MALE PIN P/N : M39029/1-101 (OF TERMINAL JUNCTION MODULE) USING HAND CRIMPING TOOL " C " AND PROTECT WITH HEAT-SHRINKABLE INSULANT SLEEVE RT-220.

6) FOR CONNECTING THE HEATERS SEE DRAWING, COVER THE SOLDER JOINT WITH HEAT-SHRINKABLE INSULATE SLEEVE RT-220.



7) ASSEMBLE MALE CONTACT P/N : M39029/58-363 (OF CONNECTOR)

8) MARKER THE WIRE WITH THE NAME OF ITEM END THE NAME OF PIN (EX. TB1/6A-A/1)
USE HEAT-SHRINKABLE INSULANT SLEEVE p/n : TMS-SCE-1K-3/16-2.0-9

DRAWING TITLE

AMS TCS
Ram Heaters Thermostats cabling
Parts list

CARLO GAVAZZI SPACE S.p.A.

FILE NAME	NEXT ASSY	PARTS LIST NUMBER	REV.
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POS.	DESCRIPTION	SPECIFICATION / PROC. SPEC	SUPPLIER	PART NUMBER / ID. CODE	ISSUE REV.	CGS CODE / MATERIAL	-01 Q.TY	-02 Q.TY	-03 Q.TY	-04 Q.TY	DATA CODE	S/N	REMARKS
1	Pin male cicolar connector awg 20	MIL-C-39029/58	Amphenol Pcd	M39029/58-363									
2	Terminal junction module 2x5 contact	MIL-81714-DB1	Amphenol Pcd	M81714/2-DB1									
3	Terminal junction module 2x10 contact	MIL-81714-DB1	Amphenol Pcd	M81714/7-DB1									
4	Wire awg 20	ESA/SCC 3901/012	Raychem	ESA/SCC 3901/012-11168									

Tab. -1 INSTRUMENT LIST

N.	EQUIPMENT	MANUFACTURER	P/N	S/N	ACCURACY (*)	NEXT CAL. DATE	REMARKS
1	RMS MULTIMETER	FLUKE	FLUKE 87	ENG LAB 299		23.05.2010	

(*) Where not specified the accuracy is as stated on the instrument manufacturer data sheet

COM
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ENG LAB 299