BULKHEAD CONNECTOR/HERMETIC SEAL

60 PIN BULKHEAD CONNECTOR WITH INTEGRAL HERMETIC SEAL, CONNECTOR PINS ON HIGH VACUUM SIDE.

BULKHEAD CONNECTOR/HERMETIC SEAL MUST CARRY 20 TYPE T THERMOCOUPLE PAIRS INCLUDING A SHIELD FOR EACH PAIR

CONNECTOR PARTS SPECIFIED IN NOTE 2

SEALANT: LOW OUTGASSING FOR HIGH VACUUM SERVICE (1X10e−07 MM Hg)

OUTGASSING: < 0.002 % VCM WHEN HEATED TO 125 DEG C AT 10−6 mm Hg, NO VISIBLE RESIDUE ON OPTICAL GLASS KEPT AT 25 DEG C

TEMPERATURE RANGE: −40 TO +225 DEG F

He LEAKAGE: < 1X10e−8 CC/SEC

CONNECTOR MATING: SCOOP PROOF

THREAD: 1 3/4"−18

HOUSING: STAINLESS STEEL WITH VACUUM FACE SEAL FITTING AND STRAIN RELIEF FOR WIRES.

O−RING MATERIAL: VITON

ONLY STAINLESS STEEL, ALUMINUM, OR NICKEL METALS EXPOSED TO VACUUM

MOUNTS TO VACUUM CHAMBER MOUNTING FLANGE (PLATE)

WIRES ASSIGNED TO CONNECTOR PINS PER TABLE 1

HERMETIC WIRE FEED-THRU

60 CONDUCTOR HERMETIC WIRE FEED−THRU MUST CARRY 20 TYPE T THERMOCOUPLE PAIRS, TYPE T, EACH 20 AWG, 2 CONDUCTOR PLUS SHIELD, STANDARD GRADE SOLID THERMOCOUPLE WIRE.

WIRES SHALL BE CONTINUOUS (NO SPLICES) WITH CONTINUITY OF EACH SHIELD MAINTAINED THROUGH FEED−THRU.

VACUUM SERVICE: 10 mm Hg.

TEMPERATURE RANGE: −40 TO +225 DEG F.

He LEAKAGE: < 1X10e−5 CC/SEC

HOUSING: STAINLESS STEEL WITH VACUUM FACE SEAL FITTING AND STRAIN RELIEF FOR WIRES.

O RING MATERIAL: VITON

THREAD: 1 3/4"−18

MOUNTS TO ENCLOSURE WALL MOUNTING FLANGE (PLATE)

THERMOCOUPLE WIRE BUNDLE

60EA − #20 AWG WIRES GROUPED AS FOLLOWS:

20 CABLES EACH COMPOSED OF 3 CONDUCTORS (1 COPPER CONDUCTOR, 1 CONSTANTAN CONDUCTOR, 1 SHIELD), SEE NOTE 4

WRAP: SPIRAL WRAP CABLE TIE SUITABLE FOR 10 mm Hg VACUUM SERVICE

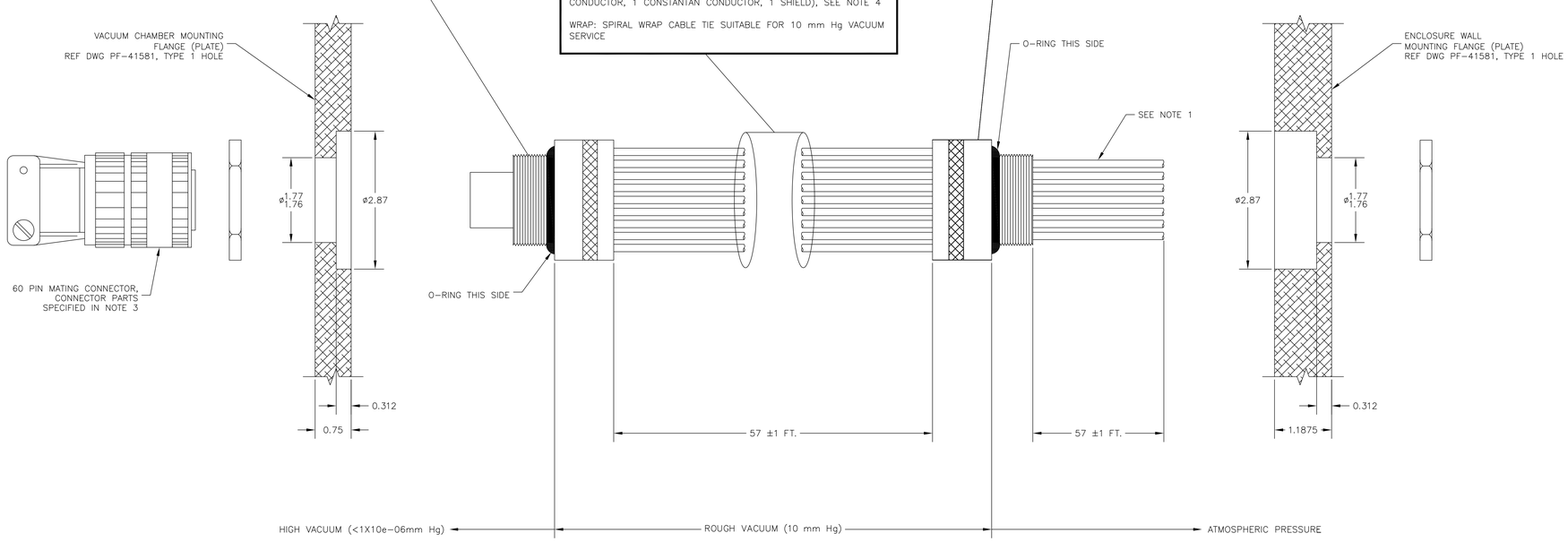

TABLE 1: WIRING & LABELING INFORMATION

LABEL	WIRE	PIN	CONNECTOR PINS & SOCKETS
01	COPPER (+) BLU	A	COPPER, TC GRADE
	CONSTANTAN (−) RED	B	CONSTANTAN, TC GRADE
	SHIELD	C	POWER GRADE
02	COPPER (+) BLU	D	COPPER, TC GRADE
	CONSTANTAN (−) RED	E	CONSTANTAN, TC GRADE
	SHIELD	F	POWER GRADE
03	COPPER (+) BLU	G	COPPER, TC GRADE
	CONSTANTAN (−) RED	H	CONSTANTAN, TC GRADE
	SHIELD	J	POWER GRADE
04	COPPER (+) BLU	K	COPPER, TC GRADE
	CONSTANTAN (−) RED	L	CONSTANTAN, TC GRADE
	SHIELD	M	POWER GRADE
05	COPPER (+) BLU	N	COPPER, TC GRADE
	CONSTANTAN (−) RED	P	CONSTANTAN, TC GRADE
	SHIELD	R	POWER GRADE
06	COPPER (+) BLU	S	COPPER, TC GRADE
	CONSTANTAN (−) RED	T	CONSTANTAN, TC GRADE
	SHIELD	U	POWER GRADE
07	COPPER (+) BLU	V	COPPER, TC GRADE
	CONSTANTAN (−) RED	W	CONSTANTAN, TC GRADE
	SHIELD	X	POWER GRADE
08	COPPER (+) BLU	Y	COPPER, TC GRADE
	CONSTANTAN (−) RED	Z	CONSTANTAN, TC GRADE
	SHIELD	a	POWER GRADE
09	COPPER (+) BLU	b	COPPER, TC GRADE
	CONSTANTAN (−) RED	c	CONSTANTAN, TC GRADE
	SHIELD	d	POWER GRADE
10	COPPER (+) BLU	e	COPPER, TC GRADE
	CONSTANTAN (−) RED	f	CONSTANTAN, TC GRADE
	SHIELD	g	POWER GRADE
11	COPPER (+) BLU	h	COPPER, TC GRADE
	CONSTANTAN (−) RED	i	CONSTANTAN, TC GRADE
	SHIELD	j	POWER GRADE
12	COPPER (+) BLU	k	COPPER, TC GRADE
	CONSTANTAN (−) RED	m	CONSTANTAN, TC GRADE
	SHIELD	n	POWER GRADE
13	COPPER (+) BLU	p	COPPER, TC GRADE
	CONSTANTAN (−) RED	q	CONSTANTAN, TC GRADE
	SHIELD	r	POWER GRADE
14	COPPER (+) BLU	s	COPPER, TC GRADE
	CONSTANTAN (−) RED	t	CONSTANTAN, TC GRADE
	SHIELD	u	POWER GRADE
15	COPPER (+) BLU	v	COPPER, TC GRADE
	CONSTANTAN (−) RED	w	CONSTANTAN, TC GRADE
	SHIELD	x	POWER GRADE
16	COPPER (+) BLU	y	COPPER, TC GRADE
	CONSTANTAN (−) RED	z	CONSTANTAN, TC GRADE
	SHIELD	AA	POWER GRADE
17	COPPER (+) BLU	BB	COPPER, TC GRADE
	CONSTANTAN (−) RED	CC	CONSTANTAN, TC GRADE
	SHIELD	DD	POWER GRADE
18	COPPER (+) BLU	EE	COPPER, TC GRADE
	CONSTANTAN (−) RED	FF	CONSTANTAN, TC GRADE
	SHIELD	GG	POWER GRADE
19	COPPER (+) BLU	HH	COPPER, TC GRADE
	CONSTANTAN (−) RED	JJ	CONSTANTAN, TC GRADE
	SHIELD	KK	POWER GRADE
20	COPPER (+) BLU	LL	COPPER, TC GRADE
	CONSTANTAN (−) RED	MM	CONSTANTAN, TC GRADE
	SHIELD	NN	POWER GRADE

GENERAL NOTES

1. LABEL EACH WIRE ON ATMOSPHERIC SIDE WITH A DURABLE WRAP−AROUND LABEL PER "LABEL" COLUMN IN TABLE 1. LABELS SHALL BE LOCATED 12 INCHES FROM ENCLOSURE WALL FEED−THROUGH. IN ADDITION, BEGINNING AT 13 INCHES, WIRE 1 OF EACH ASSEMBLY SHALL BE LABELED WITH A NUMBER 41577−XXX WHERE XXX REPRESENTS THE SERIAL NUMBER OF A MANUFACTURED ASSEMBLY.

2. CHAMBER BULKHEAD CONNECTOR (HIGH VACUUM SIDE): MS27466G25F61P (A1)

   COPPER TC GRADE CRIMP PINS: SAME AS M39029/58−363, EXCEPT OXYGEN FREE COPPER, ELECTROLYTIC TOUGH PITCH C11000.

   CONSTANTAN TC GRADE CRIMP PINS: M39029/87−474

   POWER GRADE CRIMP PINS (FOR SHIELDS): M39029/58−363

   PROTECTION CAP: MS27502F25

3. MATING CONNECTOR (HIGH VACUUM SIDE): MS27467G25F61S

   COPPER TC GRADE CRIMP SOCKETS: SAME AS M39029/56−354, EXCEPT OXYGEN FREE COPPER, ELECTROLYTIC TOUGH PITCH C11000, 4 FINGERS W/BeCu NAPKIN RING. (A2)

   CONSTANTAN TC GRADE CRIMP SOCKETS: M39029/88−486

   POWER GRADE CRIMP SOCKETS (FOR SHIELDS): M39029/56−354

   STRAIN RELIEF: M85049/49−2−24F (A2)

   FOR PROCUREMENT PURPOSES THE MATING CONNECTOR IS NOT CONSIDERED A PART OF THE THERMOCOUPLE FEED−THRU/CABLE ASSEMBLY.

4. THE THERMOCOUPLE WIRE SHALL BE TESTED AND CERTIFIED TO MEET THE PERFORMANCE STANDARDS SET FORTH IN ASTM E 230−03 APPENDIX TABLES 1 AND 22, USING THE STANDARD TEST METHOD FOR CALIBRATION OF THERMOCOUPLES BY COMPARISON TECHNIQUES DESCRIBED IN ASTM E 220−07A, OVER A TEMPERATURE RANGE OF −40 TO +225 DEG F.

   EACH SPOOL OF WIRE (2000 FT. MAX.) SHALL BE UNIQUELY IDENTIFIED, AND A FIVE−FOOT TEST SAMPLE CUT FROM BOTH ENDS OF EACH SPOOL. THE WIRE SUPPLIER SHALL TEST EACH SPOOL BY FABRICATING A THERMOCOUPLE JUNCTION ON ONE END OF EACH WIRE SAMPLE AND TESTING IT ACCORDING TO THE ABOVE STANDARDS. ALL SAMPLES ARE TO BE PRESERVED, IDENTIFIED RELATIVE TO THEIR CORRESPONDING SPOOL, AND DELIVERED TO NASA FOR STORAGE AND POSSIBLE RETESTING BY THE U.S. GOVERNMENT. IN ADDITION, FOR EACH SPOOL, THE WIRE SUPPLIER SHALL MEASURE THE END−TO−END RESISTANCE OF EACH CONDUCTOR AND PERFORM 100−VOLT HIPOT INSULATION TESTS (CONDUCTOR−TO−CONDUCTOR AND EACH CONDUCTOR−TO−SHIELD).

   BASED ON THE SAMPLE TESTING, THE WIRE SUPPLIER SHALL PROVIDE A WIRE QUALITY TEST REPORT FOR EACH SPOOL. ALSO TO BE INCLUDED ARE RECORDS OF ANY FAILED THERMOCOUPLE WIRE FOUND DURING THE COURSE OF THE TESTING.

   THE WIRE SUPPLIER SHALL ALSO PROVIDE A WRITTEN AND SIGNED CERTIFICATION STATING THAT EACH SPOOL OF THERMOCOUPLE WIRE MEETS THE ABOVE PERFORMANCE STANDARDS.

   FOR EACH CABLE ASSEMBLY, THE FABRICATOR SHALL REPORT TO NASA WHICH SPOOL WAS USED TO SUPPLY THE WIRE FOR EACH CHANNEL (1 THROUGH 20).

   THE WIRE SUPPLIER SHALL BE ACCREDITED BY NVLAP FOR CALIBRATION LABORATORIES IN ACCORDANCE WITH ISO/IEC 17025:2005 FOR SERVICES DEFINED BY LAB CODE 200512−0, NVLAP CODE 20/A01, ANSI/NCSL Z540−1−1994; Part 1, AND NVLAP CODE 20/T08 (THERMOCOUPLES − TYPE T).

5. FOR EACH CHANNEL WITHIN EACH FABRICATED CABLE ASSEMBLY, THE VENDOR SHALL MEASURE AND RECORD THE END−TO−END RESISTANCE OF EACH CONDUCTOR (+, −, SHIELD) AND PERFORM 100−VOLT HIPOT INSULATION TESTS (CONDUCTOR−TO−CONDUCTOR, EACH CONDUCTOR−TO−SHIELD, AND SHIELD TO ALL OTHER SHIELDS TIED TOGETHER). A REPORT CONTAINING THE RESULTS OF THESE TESTS SHALL BE DELIVERED WITH EACH CABLE ASSEMBLY.

CHG	NUM	DESCRIPTION	APP/DATE
A	2	CORRECTED NOTE 3 MATING CONNECTOR PART No., POWER GRADE CRIMP SOCKET PART No., COPPER TC GRADE CRIMP SOCKETS & STRAIN RELIEF PART No.	
	1	CORRECTED NOTE 2 BULKHEAD CONNECTOR PART No.	

REVISIONS

LAST APPROVED EDMS REVISION	TECH LEAD:	FAC−SYS MGR:	REV DATE:

CAD DRAWING - DO NOT REVISE MANUALLY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN H. GLENN RESEARCH CENTER
LEWIS FIELD
CLEVELAND, OHIO

BLDG 1411 - SPF - PLUM BROOK STATION

SPECIFICATION
SPF THERMOCOUPLE
FEED-THRU / CABLE ASSEMBLY

SIZE	BLDG/SYS	PROJECT ID	DISCP	TYP SEQ
PE	1411 -	00041577	- E-	801

AREA: | SHEET 01 OF 01

UNITS: ENGLISH | SOFTWARE: AUTOCAD 2010 | REVISION A

SCALE: NONE | OFFICIAL DATE: 06/23/2010

PLUM BROOK STATION
6100 COLUMBUS AVENUE
SANDUSKY, OHIO

SYSTEM ID	FACILITY ID	CONFIG CTRL
-	SPF	PBRK

DR. K. WINKE - 6/23/10 | DES. S. GRISNIK - 6/23/10
D.ENG. R. ZIEMKE - 6/23/10
PROJ. MGR. H. SPEIER - 6/23/10 | TECH LEAD/BR CH R. EVANS - 6/23/10
FAC/SYS MGR: J. CAREK - 6/23/10 | DIV CHIEF:
CONTRACTOR | CONTRACT NO. | TASK ORDER | DRAWN | DESIGNED | CHECKED | APPROVED | APPROVAL DATE
RELEASE STATUS: RELEASED

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