S

ENGINEERING CHANGE NOTICE

H

1. ECN 654887

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	Stubbs, AM/15500/T5-55/373-9380	[X] Yes [] No	09/15/99
	6. Project Title/No./Work Order No.	7. Bldg./Sys./Fac. No.	8. Approval Designator
	ATP for HC-21I/100741	234-5Z/73T	NA
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-CP-ATP-071 Rev 0 1 AMS 9-21-99	10. Related ECN No(s). NA	11. Related PO No. NA

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	NA	NA Design Authority/Cog. Engineer Signature & Date	NA Design Authority/Cog. Engineer Signature & Date

13a. Description of Change 13b. Design Baseline Document? [X] Yes [] No

Direct Revision of WHC-Sd-CP-ATP-071 Rev 0 1 AMS 9-21-99

1) Deletes from the Acceptance Test Procedure HA-20MB software testing.

14a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

HA-20MB was dropped from the additional muffle furnace installation project.

15. Distribution (include name, MSIN, and no. of copies)

D.R. Groth	T4-15		
R. Risenmay	T5-55	L.E. Edvalson	T5-48
A.M Stubbs	T5-55	G. A. Glover	T4-20
O.P Dhiman	T4-20	B. Glenn	T4-19
D.R. Speer	T5-50	Central Files	B1-07

RELEASE STAMP

SEP 21 1999

DATE:

STA: 5

HANFORD RELEASE

ID: 12

A-7900-013-2 (05/96) GEF095

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 654887

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $ NA	Additional	[] $ NA	Improvement	[]NA
[X] No	Savings	[] $ NA	Savings	[] $ NA	Delay	[]NA

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[X]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[X]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]	NA	[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
AMS 9-21-99 ~~WHC-SD-CP-ATP-071 Rev 2~~	NA	NA

21. Approvals

	Signature	Date
Design Authority	H. Rees Risenmay	9-15-99
Cog. Eng.		
Cog. Mgr.	Ann P Dhruman for DER	9-21-99
QA	DR Groth	9-20-99
Safety		
Environ.		
Other		

	Signature	Date
Design Agent		
PE		
QA		
Safety		
Design		
Environ.		
Other		

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Signature 9/24/99 Date
AUTHORIZED CLASSIFIER

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

ECN 654887

UNREVIEWED SAFETY QUESTION (USQ) SCREENING AND EVALUATION		
1. Identification Number: HNF-SD-CP-ATP-071 Rev 1	USQ SCREENING	Page 3 of 5
2. Title: Honeywell Modular Automation System Acceptance Test Procedure.		

DESCRIPTION:

The Acceptance Test Procedure Describes a method to test the Honeywell Modular Automation System programming(PLC/MAS) using simulated inputs. The PLC programming controls the HA-21I furnaces heating cycle, off-gas vacuum pumps and monitors glovebox temperature during operation. The change to the ATP removes testing HA-20MB furnace PLC/MAS. The furnaces were never installed in HA-20MB.

INTRODUCTION:

The purpose of this Acceptance Test Procedure (ATP) is to verify the operability of the three new furnaces as controlled by the new Honeywell Modular Automation System(MAS). The Honeywell MAS is being installed in PFP to control the three thermal stabilization furnaces in glovebox HA-21I. The ATP provides instructions for testing the configuration of the Honeywell MAS at the Plutonium Finishing Plant(PFP). The test will be a field test of the analog inputs, analog outputs, and software interlocks. The interlock test will check the digital input and outputs. Field equipment will not be connected for this test. Simulated signals will be used to test thermocouple, limit switch, and vacuum pump inputs to the PLC/MAS.

The following sections in HNF-SD-CP-SAR-021 Rev 1 describe the use of HA-21I and the PLC:

Section 6.4.1.1 Process Description - -

Section 6.4.1.1.1 -- Narrative Description -- The section states that thermal stabilization is performed in HA-21I and the type of feed allowed in HA-21I.

Sub-heading Process Feed -- The section states that thermal stabilization is performed in HA-21I.

Sub-heading Stabilization -- The section discusses the furnace operation in HA-21I and that the furnaces are controlled with a PLC(MAS) rather than individual controllers.

HNF-SD-CP-SAR-021 Rev 1, Appendix 9A, Plutonium Finishing Plant Hazard Evaluation, Table 9A.1.1 Item 21. The item discusses the various types of failures that could happen during the operation of HA-21I.

AFFECTED SSC: No SSC's are affected by this ATP change.

AUTHORIZATION BASIS:

The authorization basis documents considered include those listed in FSP-PFP-5-8, section 2.23, appendix A.
These are:
HNF-SD-CP-SAR-021 Rev 1

UNREVIEWED SAFETY QUESTION (USQ) SCREENING AND EVALUATION		
1. *Identification Number:* HNF-SD-CP-ATP-071 Rev 1	**USQ SCREENING**	Page 4 of 5
2. Title: Honeywell Modular Automation System Acceptance Test Procedure.		

CONCLUSION:

The performance of this ATP test the PLC(MAS) is within the bounds of the Plutonium Finishing Plant Authorization Basis. The use of the PLC is discussed in Chapter 6 of HNF-SD-CP-SAT-021 Rev 1. All questions were answered "No", therefore, a USQ Evaluation is not required.

REFERENCES:
none

INSTRUCTIONS: Respond to each question and provide justification for each response. A restatement of the question does not constitute a satisfactory justification or basis. An adequate justification provides sufficient explanation such that an independent reviewer could reach the same conclusion based on the information provided [DOE 5480.21, 10.e.1].

QUESTIONS

1. Does the proposed change or occurrence represent a change to the facility or procedures as described in the Authorization Basis?
[ ] N/A [X] No [ ] Yes/Maybe

BASIS: The ATP HNF-SD-CP-ATP-071 Rev 1 provides instructions for testing the configuration of the Honeywell MAS at the Plutonium Finishing Plant(PFP). Section 6.4.1.1.1, Sub-heading Stabilization -- The section discusses the furnace operation in HA-21I and that the furnaces are controlled with a PLC(MAS) rather than individual controllers as used with HC-21C. The ATP as written to verify the operability of the three new furnaces in HA-21I does not add any additional operational requirements that have not been discussed in HNF-SD-CP-SAR-021 Rev 1. The ATP would not change the authorization basis.

2. Does the proposed change or occurrence represent conditions that have not been analyzed in the Authorization Basis?
[ ] N/A [X] No [ ] Yes/Maybe

BASIS: The ATP, HNF-SD-CP-ATP-071 Rev 1, activities as written will not create new conditions for the facility, since HNF-SD-CP-SAR-021 Rev 1 discusses the use of the PLC to control the HA-21I furnaces in chapter 6, Section 6.4.1.1 Process Description

. Does the proposed change represent a test or experiment *NOT described in the Authorization Basis that may affect the* safe operation of the facility?
[ ] N/A [X] No [ ] Yes/Maybe

BASIS: The acceptance test as written, will not affect the safe operation of the facility since the controller will not be connected to any facility equipment. All inputs will be simulated and the outputs monitored.

4. Does the proposed change or occurrence represent a change to the Technical Safety Requirements or a reduction in the margin of safety defined in the Technical Safety Requirements?
[ ] N/A [X] No [ ] Yes/Maybe

BASIS: Performance of this ATP does not require any OSR/TSR changes.

ECN 654887

UNREVIEWED SAFETY QUESTION (USQ) SCREENING AND EVALUATION		
1. Identification Number: HNF-SD-CP-ATP-071 Rev 1	**USQ SCREENING**	Page 5 of 5
2. Title: Honeywell Modular Automation System Acceptance Test Procedure.		

USQE #1 Art Stubbs (Print Name)

USQE #2 J.P. King (Print Name)

Art Stubbs Signature Date: 9-16-99

Jeffrey P. King Signature Date: 9/16/99

If there is a YES/MAYBE response to questions 1, 2, 3, or 4, then a USQ Evaluation must be completed.

The following guidance should be considered when completing this screening. This guidance should not be considered all-inclusive; additional factors may need to be considered depending on the nature of the proposed change.

Does the proposed change:

1) Modify, add, or delete a safety class function of a structure, system or component stated in the authorization basis?
2) Alter the design of a structure, system or component as described in the authorization basis?
3) Modify, add, or delete the description of operation, operating environment, or analyses of any system or component described in the authorization basis?
4) Modify, add, delete or conflict with any of the design bases stated in the authorization basis?
5) Conflict with the principle or general design criteria stated in the authorization basis?
6) Modify, add, or delete any plant design features described in the authorization basis?
7) Modify, add, or delete a flow diagram or facility drawing provided in the authorization basis?
8) Create the potential for new system or component interactions (e.g., seismic, electrical breaker coordination)?

Honeywell Modular Automation System Acceptance Test Procedure

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U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 654887 UC: UC-506
Org Code: 15530 Charge Code: 100741
B&R Code: EW7003000 Total Pages: 30

Key Words: Honeywell, Modular Automation System, MAS, Thermal Stabilization, Acceptance Test

Abstract: This document provides instruction for the acceptance testing of the control system for the 3 new stabilization furnaces being installed in HA-21I and ancillary equipment

9/21/99
Release Approval Date

SEP 21 1999
DATE:
STA: 5
HANFORD RELEASE
ID: 12
Release Stamp

Approved for Public Release

RECORD OF REVISION

(1) Document Number: HNF-SD-CP-ATP-071

(2) Title: Honeywell Modular Automation System Acceptance Test Procedure

Change Control Record

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) Initial Release EDT 610800 (1-29-99) 6 Amy 2-21-99		
1	Revision of ATP that involves the testing of only the HA-21I furnaces. Scope of furnace		
	installation projects has changed and eliminated the furnace installation in HA-20MB. Address		
	changes of the discrete input and output cards included in this revision. ECN 631015		
2 RS	Deleted HA-20MB from ATP, with ECN 654887	AM Stubbs D.M. Stubbs	9/21/99

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this Acceptance Test Procedure (ATP) is to verify the operability of the three new furnaces as controlled by the new Honeywell Modular Automation System (MAS). The Honeywell MAS is being installed in the PFP to control the three thermal stabilization furnaces in glovebox HA-21I.

2.0 SCOPE

This ATP provides instructions for testing the configuration of the Honeywell MAS at the Plutonium Finishing Plant (PFP). The test will be a field test of the analog inputs, analog outputs, and software interlocks. The interlock test will check the digital input and outputs. Field equipment will not be connected for this test. Simulated signals will be used for thermocouple and limit switch inputs. An Operational Test Procedure (OTP) will be written to perform field testing once the MAS and furnaces have been installed.

3.0 REFERENCES

WHC-IP-1026, *Engineering Practice Guidelines*, Appendix M

4.0 RESPONSIBILITIES

Test Director

The test director will be selected from the PFP Process Engineering Group. The Test Director shall:

- Coordinate and direct acceptance testing.
- Confirm that all prestart requirements have been met before allowing the test to begin.
- If needed, alter the test sequence after verifying that there is no adverse impact.
- Ensure that the system is left in a safe mode if the test is to be suspended for a period of time.

- Reverify test prerequisites before restarting a suspended test.
- Initial each step in the test procedure as it is performed.
- Evaluate the need to make changes to the test and initiate ECNs to document those changes.
- Review and approve test data sheets and exceptions.
- Approve resolution to test exceptions.

Witnesses

A test witness shall be provided by Quality Assurance. Test witnesses shall:

- Witness all or selected portions of the test.
- Review and approve test data sheets and exceptions for the sections of the test that they witness.
- Approve resolution to test exceptions for the sections of the test that they witness.

Test Performer

The person performing the test shall be designated by the test director. The performer shall:

- Perform the test under the direction of the test director.
- Record required information on the test data sheets as well as initial and date the form.

5.0 SYSTEM DESCRIPTION

The thermal stabilization furnaces will be used to stabilize plutonium bearing materials at the PFP for long term storage. Three new furnaces located in glovebox HA-21I will be connected to a Honeywell MAS (see Figure 1). The control configuration of the Honeywell MAS provides temperature control to heat the furnaces to 1000°C and hold for a prescribed duration depending on the type of material being heated in the furnace. Analog input signals being processed by the MAS include: furnace control temperature, furnace high alarm temperature, furnace

off-gas temperature, and glovebox temperature. Analog output signals are sent to the Silicon Control Rectifier (SCR) to supply power to the furnaces. Digital inputs include the furnace door limit switches and a power signal from the off-gas fans. Digital outputs include relay power from the furnace interlock logic and the off-gas fan start/stop signal.

6.0 SAFETY

A pre-job safety meeting shall be conducted in accordance with *Plutonium Operation Administration Manual*, HNF-IP-0821, Chapter 12, Section 5.12 and meeting attendance shall be documented in Table 1 by Process Engineering prior to work start. This ATP shall be read and discussed in detail by all personnel involved with its performance.

TABLE 1
PRE-JOB SAFETY/OPERABILITY BRIEFING LIST

PRESENTER: DATE:

ATTENDEES	ORGANIZATION	ATTENDEES	ORGANIZATION

7.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

The control configuration acceptance test will be performed in room 230A and 235B in the PFP complex. The personal computer (PC) will be connected to the Honeywell MAS with a coaxial cable. The 50-ohm terminating resistors will be in place. Leads maybe lifted or blocks replaced with electrical/thermocouple connections as needed during performance of this ATP.

A special test box will be used to test the function of the 115V discreet inputs (see Figure 2). The box contains four separate test points. Each point has its own switch and removable cable. The cable is connected to the address point and the common (B1, B2, or B3). To turn on the input, the switch is closed, and to turn it off, the switch is opened. To prevent electric shock, any unused electric cables must be disconnected from the box. In addition, the cable must be disconnected from the box whenever connecting or disconnecting from the digital input card.

Current measurement and continuity checks will be taken with a FLUKE 8060A:

Device ID #_____ Last Calibrated_____
Next Calibration_____

For Type K thermocouple signal generation, either of the following instruments can be utilized:

Calibrated Transmation PPS minitemp Calibrator, Model 1064P

Device ID #_____ Last Calibrated_____
Next Calibration_____

OR

Calibrated Transmation PPS Flexitester, Model 1080

Device ID #_____ Last Calibrated_____
Next Calibration_____

8.0 PROCEDURE

Discrepancies will be noted on the Exceptions List provided (Section 8.0) and according to provisions outlined in WHC-IP-1026, *Engineering Practice Guidelines*, Appendix M.

____ 8.1 Download the current controller configuration to the logic controller.

____ 8.2 Enter VIEW from the windows screen and acknowledge all alarms.

Thermocouple Input Checks (see Figure 3)

____ 8.3 From the FURNACE 21I-1 screen, test the following temperature inputs for FUR-21I-1.

____ 8.3.1 Input compensated temperature inputs to Address 32 per data sheet 1 to check temperature controller thermocouple input.

____ 8.3.2 Input compensated temperature inputs to Address 33 per data sheet 1 to check furnace high temperature alarm thermocouple input.

____ 8.3.3 Input compensated temperature inputs to Address 41 per data sheet 1 to check off-gas thermocouple input.

____ 8.4 From the FURNACE 21I-2 screen, test the following temperature inputs for FUR-21I-2.

____ 8.4.1 Input compensated temperature inputs to Address 34 per data sheet 1 to check temperature controller thermocouple input.

____ 8.4.2 Input compensated temperature inputs to Address 35 per data sheet 1 to check furnace high temperature alarm thermocouple input.

____ 8.4.3 Input compensated temperature inputs to Address 42 per data sheet 1 to check off-gas thermocouple input

____ 8.5 From the FURNACE 21I-3 screen, test the following temperature inputs for FUR-21I-3.

____ 8.5.1 Input compensated temperature inputs to Address 36 per data sheet 1 to check temperature controller thermocouple input.

____ 8.5.2 Input compensated temperature inputs to Address 37 per data sheet 1 to check furnace high temperature alarm thermocouple input.

____ 8.5.3 Input compensated temperature inputs to Address 43 per data sheet 1 to check off-gas thermocouple input.

____ 8.6 From the FURNACE OVERVIEW screen, test the following temperature inputs for glovebox HA-21I.

____ 8.6.1 Connect blank test thermocouples to Addresses 39 and 40. Input compensated temperature inputs to Address 38 per data sheet 1 to glovebox thermocouple input.

____ 8.6.2 Connect blank test thermocouples to Addresses 38 and 40. Input compensated temperature inputs to Address 39 per data sheet 1 to glovebox thermocouple input.

____ 8.6.3 Connect blank test thermocouples to Addresses 38 and 39. Input compensated temperature inputs to Address 40 per data sheet 1 to glovebox thermocouple input.

Check Analog Output for SCR (see Figure 4)

____ 8.7 Record the output of address 72 when Output for furnace 21I-1 is 0% as seen on the FURNACE 21I-1 screen. _____mA.

____ 8.8 From FURNACE 21I-1 screen, start heating cycle by pressing the 1-OXIDE button.

____ 8.9 Monitor output of address 72. Output shall be in 4-20mA ± 0.1mA range and should increase as the setpoint climbs.

____ 8.10 Record output for address 72 when Output for furnace 21I-1 is 100% as seen on the FURNACE 21I-1 screen. _____mA

____ 8.11 Stop heating cycle by pressing Stop Cycle button.

____ 8.12 Record the output of address 73 when Output for furnace 21I-2 is 0% as seen on the FURNACE 21I-2 screen. _____mA

____ 8.13 From FURNACE 21I-2 screen, start heating cycle by pressing the 1-OXIDE button.

____ 8.14 Monitor output of address 73. Output shall be in 4-20mA ± 0.1mA range and should increase as the setpoint climbs.

____ 8.15 Record output for address 73 when Output for furnace 21I-2 is 100% as seen on the FURNACE 21I-2 screen. _____mA

____ 8.16 Stop heating cycle by pressing Stop Cycle button.

____ 8.17 Record the output of address 74 when Output for furnace 21I-3 is 0% as seen on the FURNACE 21I-3 screen. _____mA

____ 8.18 From FURNACE 21I-3 screen, start heating cycle by pressing the 1-OXIDE button.

____ 8.19 Monitor output of address 74. Output shall be in 4-20mA ± 0.1mA range and should increase as the setpoint climbs.

____ 8.20 Record output for address 74 when Output for furnace 21I-3 is 100% as seen on the FURNACE 21I-3 screen. _____mA

____ 8.21 Stop heating cycle by pressing Stop Cycle button.

Interlock Validation

____ 8.22 On the Digital Input card 621-1160R, ensure the jumpers are connected across contact points B1, B2, and B3 and contact points T1, T2, and T3. (see Figure 5)

____ 8.23 On the Digital Output card 621-2150R, ensure the jumpers are connected across contact points B1, B2, and B3 and contact points T1, T2, and T3. (see Figure 6)

____ 8.24 Install test thermocouples to addresses 32-43 on the UAIs.

____ 8.25 On the FURNACE OVERVIEW screen, ensure EMERGENCY SHUTDOWN button is RED. Push EMERGENCY SHUTDOWN button if gray.

____ 8.26 Connect Digital input test box to input addresses 80, 81, and 82. The common (-) is to be connected to B1/B2/B3.

____ 8.27 Close contacts 80, 81, and 82. The furnace doors should be closed on FURNACE OVERVIEW screen for FUR-21I-1, FUR-21I-2, FUR-21I-3.

8.28 Perform Furnace FUR-21I-1 interlock validation.

____ 8.28.1 From FURNACE 21I-1 screen, start heating cycle by pressing the 1-OXIDE button.

____ 8.28.2 Verify continuity for address 96 on the DI card.

____ 8.28.3 Open contact 80 with DI test box.

____ 8.28.4 Verify open circuit for address 96.

____ 8.28.5 Verify door to furnace FUR-21I-1 opens.

____ 8.28.6 Close contact 80 with DI test box.

____	8.28.7	Verify continuity for address 96.
____	8.28.8	Verify door to furnace FUR-21I-1 closes.
____	8.28.9	Press Stop Cycle Button.
____	8.28.10	Verify open circuit for address 96.
____	8.28.11	Restart heating cycle by pressing the 1-OXIDE button.
____	8.28.12	Verify closed circuit for address 96.
____	8.28.13	Wait for deviation alarm to annunciated when setpoint is 20±1°C above furnace temperature.
____	8.28.14	Verify open circuit for address 96.
____	8.28.15	Remove test thermocouple from address 33 and input compensated temperature of 1055°C.
____	8.28.16	Restart heating cycle by pressing the Stop Cycle button and then the 1-OXIDE button.
____	8.28.17	Verify open circuit for address 96.
____	8.28.18	Replace test thermocouple in address 33.
____	8.28.19	Verify closed circuit for address 96.
____	8.28.20	Remove test thermocouple from address 38 and input compensated temperature of 75°C.
____	8.28.21	Verify open circuit for address 96.
____	8.28.22	Replace test thermocouple in address 38.
____	8.28.23	Verify closed circuit for address 96.

____ 8.28.24 Press Emergency Stop Button.

____ 8.28.25 Verify open circuit for address 96.

8.29 Perform Furnace FUR-21I-2 interlock validation.

____ 8.29.1 From FURNACE 21I-2 screen, start heating cycle by pressing the 1-OXIDE button.

____ 8.29.2 Verify continuity for address 97 on the DI card.

____ 8.29.3 Open contact 81 with DI test box.

____ 8.29.4 Verify open circuit for address 97.

____ 8.29.5 Verify door to furnace FUR-21I-2 opens.

____ 8.29.6 Close contact 81 with DI test box.

____ 8.29.7 Verify continuity for address 97.

____ 8.29.8 Verify door to furnace FUR-21I-2 closes.

____ 8.29.9 Press Stop Cycle Button.

____ 8.29.10 Verify open circuit for address 97.

____ 8.29.11 Restart heating cycle by pressing the 1-OXIDE button.

____ 8.29.12 Verify closed circuit for address 97.

____ 8.29.13 Wait for deviation alarm to annunciated when setpoint is 20±1°C above furnace temperature.

____ 8.29.14 Verify open circuit for address 97.

____ 8.29.15 Remove test thermocouple from address 35 and input compensated temperature of 1055°C.

____ 8.29.16 Restart heating cycle by pressing the Stop Cycle button and then the 1-OXIDE button.

____ 8.29.17 Verify open circuit for address 97.

____ 8.29.18 Replace test thermocouple in address 35.

____ 8.29.19 Verify closed circuit for address 97.

____ 8.29.20 Remove test thermocouple from address 38 and input compensated temperature of 75°C.

____ 8.29.21 Verify open circuit for address 97.

____ 8.29.22 Replace test thermocouple in address 38.

____ 8.29.23 Verify closed circuit for address 97.

____ 8.29.24 Press Emergency Stop Button.

____ 8.29.25 Verify open circuit for address 97.

8.30 Perform Furnace FUR-21I-3 interlock validation.

____ 8.30.1 From FURNACE 21I-3 screen, start heating cycle by pressing the 1-OXIDE button.

____ 8.30.2 Verify continuity for address 98 on the DI card.

____ 8.30.3 Open contact 82 with DI test box.

____ 8.30.4 Verify open circuit for address 98.

____	8.30.5	Verify door to furnace FUR-21I-3 opens.
____	8.30.6	Close contact 82 with DI test box.
____	8.30.7	Verify continuity for address 98.
____	8.30.8	Verify door to furnace FUR-21I-3 closes.
____	8.30.9	Press Stop Cycle Button.
____	8.30.10	Verify open circuit for address 98.
____	8.30.11	Restart heating cycle by pressing the 1-OXIDE button.
____	8.30.12	Verify closed circuit for address 98.
____	8.30.13	Wait for deviation alarm to annunciated when setpoint is 20±1°C above furnace temperature.
____	8.30.14	Verify open circuit for address 98.
____	8.30.15	Remove test thermocouple from address 37 and input compensated temperature of 1055°C.
____	8.30.16	Restart heating cycle by pressing the Stop Cycle button and then the 1-OXIDE button.
____	8.30.17	Verify open circuit for address 98.
____	8.30.18	Replace test thermocouple in address 37.
____	8.30.19	Verify closed circuit for address 98.
____	8.30.20	Remove test thermocouple from address 38 and input compensated temperature of 75°C.
____	8.30.21	Verify open circuit for address 98.

____ 8.30.22 Replace test thermocouple in address 38.

____ 8.30.23 Verify closed circuit for address 98.

____ 8.30.24 Press Emergency Stop Button.

____ 8.30.25 Verify open circuit for address 98.

____ 8.31 Disconnect test box from addresses 80, 81, and 82.

Check Digital Signals for Off-Gas Fans

____ 8.32 On the Digital Output card 621-2150R, ensure the jumpers are connected across contact points B1, B2, and B3 and contact points T1, T2, and T3. (see Figure 6)

____ 8.33 From the OFF-GAS FAN screen, press Vacuum Fan 1 button to close contact. Motor and part of line going through the motor should turn RED.

____ 8.34 Verify continuity between contact 4 (address 99) and B1/B2/B3 on the digital input card.

____ 8.35 From the OFF-GAS FAN screen, press Vacuum Fan 1 button to open contact. Motor and part of line going through the motor should turn black.

____ 8.36 Verify open circuit between contact 4 (address 99) and B1/B2 on the digital input card.

____ 8.37 From the OFF-GAS FAN screen, press Vacuum Fan 2 button to close contact. Motor and part of line going through the motor should turn RED.

____ 8.38 Verify continuity between contact 5 (address 100) and B1/B2/B3 on the digital input card.

____ 8.39 From the OFF-GAS FAN screen, press Vacuum Fan 2 button to open contact. Motor and part of line going through the motor should turn black.

____ 8.40 Verify open circuit between contact 5 (address 100) and B1/B2/B3 on the digital input card.

____ 8.41 Connect Digital input test box to input addresses 83 and 84. The common (-) is to be connected to B1/B2/B3.

____ 8.42 Close circuit to address 83 and verify that the OFF-GAS FAN light on FURNACE OVERVIEW changes to red.

____ 8.43 Open circuit to address 83 and verify that the OFF-GAS FAN light on FURNACE OVERVIEW changes to white.

____ 8.44 Close circuit to address 84 and verify that the OFF-GAS FAN light on FURNACE OVERVIEW changes to red.

____ 8.45 Open circuit to address 84 and verify that the OFF-GAS FAN light on FURNACE OVERVIEW changes to white.

____ 8.46 Disconnect test box from address 83 and 84. Disconnect common from B1/B2/B3.

____ 8.47 Test Engineer and Quality Control will verify configuration of PCL rack per Drawing H-2-824345 Sh 3

_____ _____

Test Engineer Quality Control

9.0 EXCEPTIONS LIST

No.	EXCEPTION	RESOLUTION	SIGNATURE/DATE
			Test Director Quality Assurance
			Test Director Quality Assurance
			Test Director Quality Assurance
			Test Director Quality Assurance

10.0 ATP ACCEPTANCE

Any equipment non-conformance or anomalies will be listed on the Exceptions List.

Upon test completion and acceptance, the Cognizant Engineer will prepare an Acceptance Test Report (ATR) from the original ATP with field entries and transmit it to Central Files via Engineering Data Transmittal (EDT).

The undersigned concur that the ATP was completed successfully. The Honeywell Modular Automation System (MAS) was tested and operates within acceptable parameters.

Quality Engineer _____/_____/Date_____
Print Signature

Cognizant Engineer_____/_____/Date_____
Print Signature

Cognizant Engineer_____/_____/Date_____
Group Manager Print Signature

APPENDIX A

FIGURES

Figure 1 - Honeywell Modular Automation System (MAS)

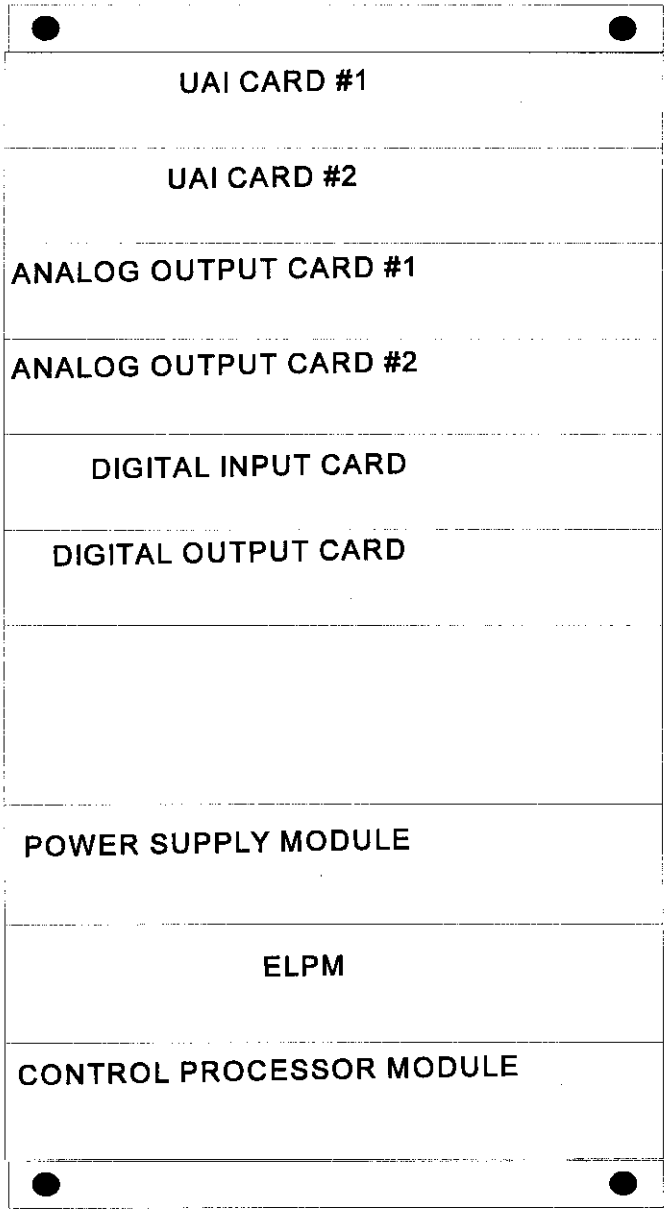


Figure 2 - Digital Input Test Box

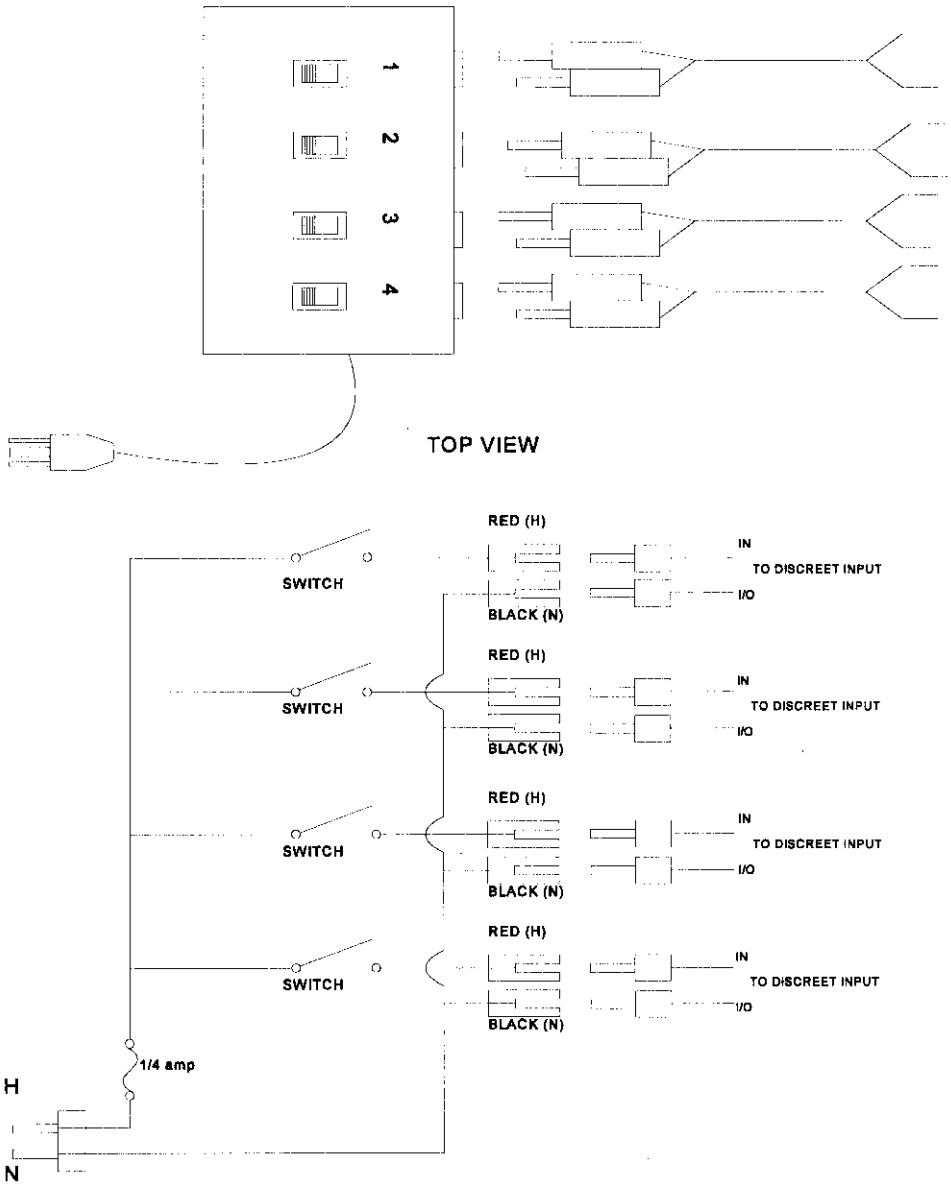


Figure 3 - Analog Input Module Connection Schematic

CARD #1 ADDRESS	CARD #2 ADDRESS	
		UNUSED — S
0	32	1
1	33	2
2	34	3
3	35	4
4	36	5
5	37	6
6	38	7
7	39	8
		UNUSED — S
8	40	9
9	41	10
10	42	11
11	43	12
12	44	13
13	45	14
14	46	15
15	47	16

Figure 4 - Analog Output Module Connection Schematic

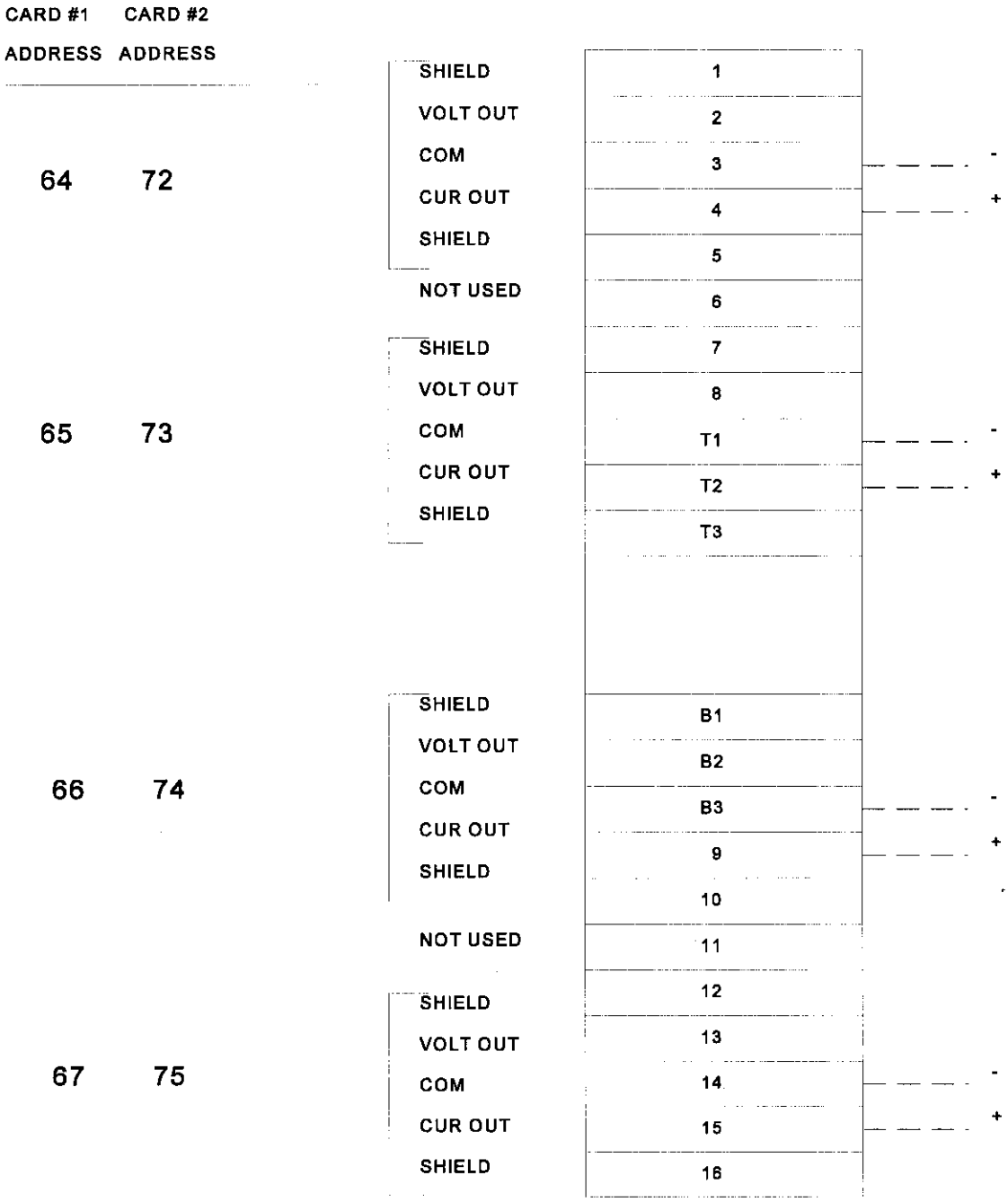


Figure 5 - Digital Input Module Connection Schematic

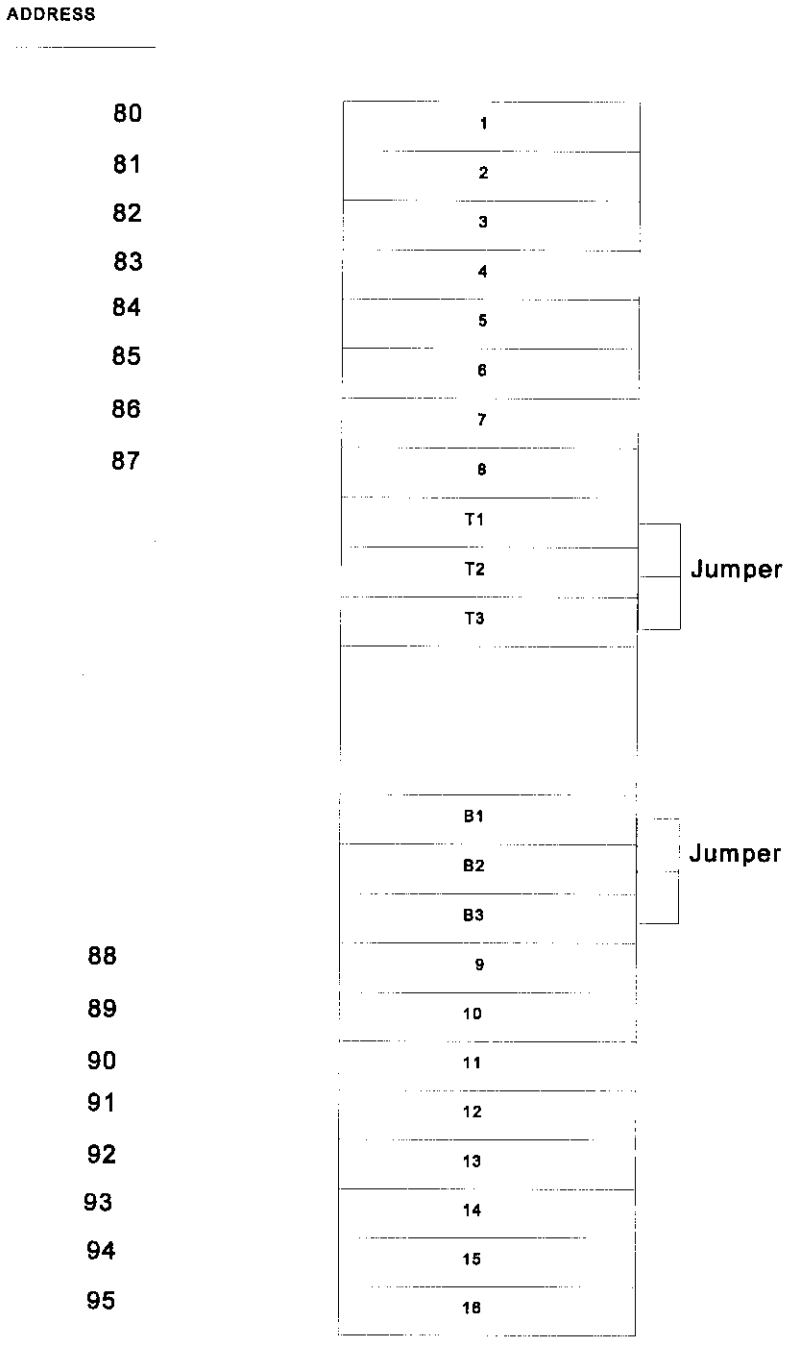
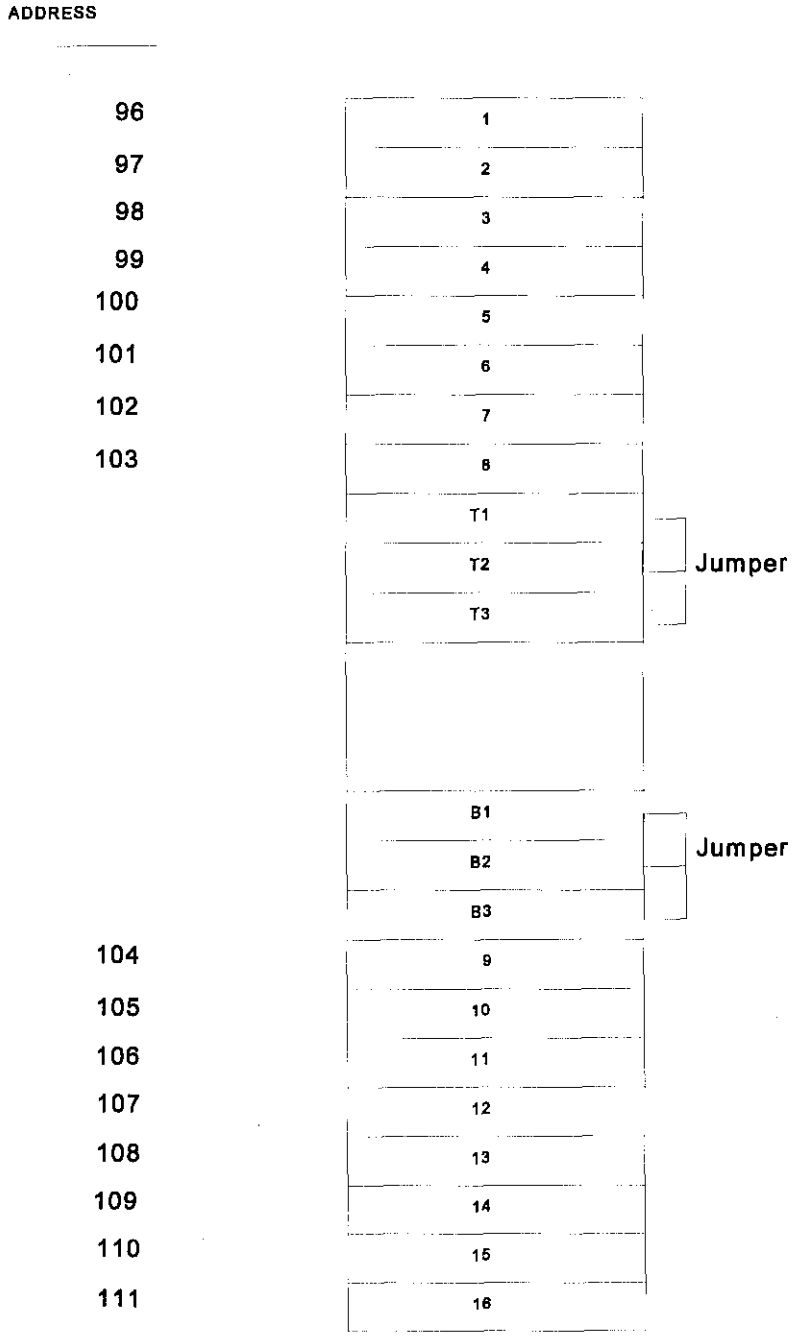


Figure 6 - Digital Output Module Connection Schematic



APPENDIX B

TEST DATA SHEETS

Data Sheet 1 - HA-21I Temperature Inputs
Page 1 of 2

STEP	ADDRESS	INPUT	DISPLAY
8.3.1	0	25 ± 0.2 °C	
		200 ± 0.2 °C	
		1000 ± 0.2 °C	
8.3.2	1	25 ± 0.2 °C	
		200 ± 0.2 °C	
		1000 ± 0.2 °C	
8.3.3	9	25 ± 0.2 °C	
		200 ± 0.2 °C	
		1000 ± 0.2 °C	
8.4.1	2	25 ± 0.2 °C	
		200 ± 0.2 °C	
		1000 ± 0.2 °C	
8.4.2	3	25 ± 0.2 °C	
		200 ± 0.2 °C	
		1000 ± 0.2 °C	
8.4.3	10	25 ± 0.2 °C	
		200 ± 0.2 °C	
		1000 ± 0.2 °C	
8.5.1	4	25 ± 0.2 °C	
		200 ± 0.2 °C	
		1000 ± 0.2 °C	

STEP	ADDRESS	INPUT	DISPLAY
8.5.2	5	25 ± 0.2 °C	
		200 ± 0.2 °C	
		1000 ± 0.2 °C	

NOTE - The display reading should be ± 0.5 °C of the input value.

Comments _____

_____

_____

Data Sheet 1 - HA-21I Temperature Inputs
Page 2 of 2

STEP	ADDRESS	INPUT	DISPLAY
8.5.3	11	25 ± 0.2 °C	
		200 ± 0.2 °C	
		1000 ± 0.2 °C	
8.6.1	6	25 ± 0.2 °C	
		75 ± 0.2 °C	
		100 ± 0.2 °C	
8.6.2	7	25 ± 0.2 °C	
		75 ± 0.2 °C	
		100 ± 0.2 °C	
8.6.3	8	25 ± 0.2 °C	
		75 ± 0.2 °C	
		100 ± 0.2 °C	

NOTE - The display reading should be ± 0.5 °C of the input value.

Test Performer _____ Test Director _____
Signature/Date Signature/Date

Quality Control _____
Signature/Date

Comments _____