



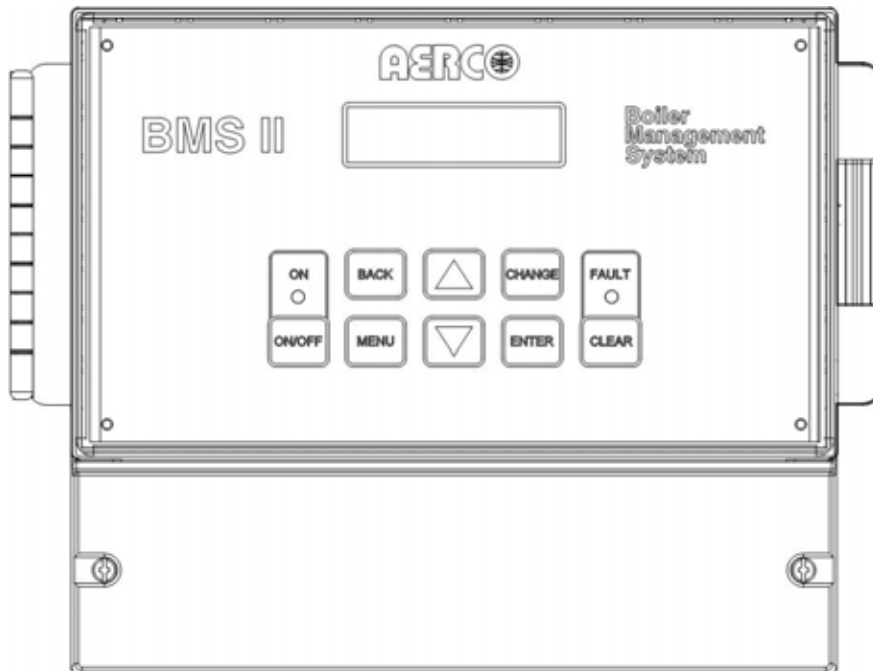
Instruction
No.

GF-124

AERCO INTERNATIONAL, Inc., Northvale, New Jersey, 07647 USA

Installation, Operation & Maintenance Instructions

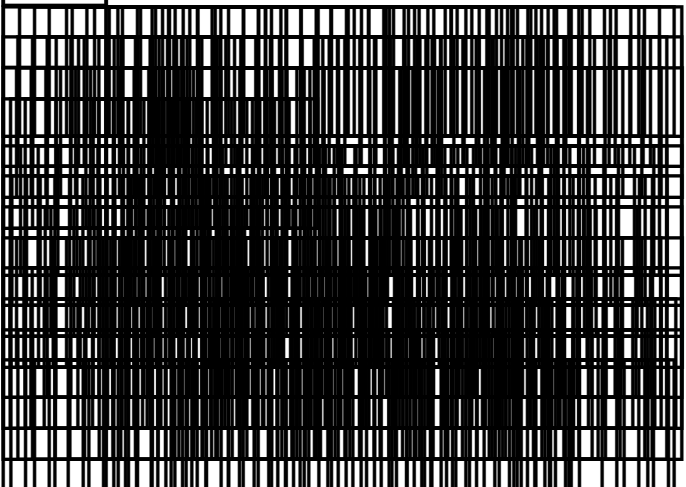
BMS II BOILER MANAGEMENT SYSTEM



JANUARY, 2009

Technology Support

AERGO



FOREWORD



Phrases, Abbreviations and Acronyms - Continued

Phrase, Abbreviation or Acronym	Meaning
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
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[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]

**GF-124 – BMS II BOILER MANAGEMENT SYSTEM
Operating & Maintenance Instructions**

TABLE OF CONTENTS

CHAPTER 1 - GENERAL INFORMATION	1-1
1.1 SAFETY PRECAUTIONS & WARNINGS	1-1
1.2 INTRODUCTION	1-1
1.3 BMS II GENERAL description	1-1
1.4 BMS II FEATURES	1-2
Simplified Installation and Set-Up	1-2
User-Friendly Control System Interface	1-2
Retention of Menu Option Settings	1-3
Application Flexibility	1-3
Sequential or Parallel Operation	1-3
Accuracy	1-3
Bumpless Transfer	1-3
Fault Alarm Surveillance	1-3
BMS II Programming Via RS232 Port	1-3
CHAPTER 2 - INSTALLATION	2-1
2.1 INTRODUCTION	2-1
2.2 SITE SELECTION AND mounting	2-1
Mounting the BMS	2-1
2.3 GENERAL WIRING REQUIREMENTS	2-2
2.4 POWER WIRING	2-3
2.5 SENSOR INSTALLATION AND WIRING	2-5
Header Sensor	2-5
Return Sensor	2-5
Outdoor Air Sensor	2-6
2.6 RS485 (MODBUS) WIRING AT the BMS II	2-8
BMS II Bias Switches	2-8
2.7 RS485 (MODBUS) WIRING AT the aenco boilers	2-9
RS485 Wiring for Benchmark Series and KC1000 Boilers	2-9
RS485 Wiring for Modulex Series Boilers	2-11
2.8 Sample RS485 (Modbus) Network Diagrams	2-12
2.9 RS232 Wiring at the BMS II	2-14
2.10 INTERLOCK WIRING	2-15
Interlock 1 (INT 1) Wiring	2-15
Interlock 2 (INT 2) Wiring	2-15
2.11 SET BACK WIRING	2-15
2.12 RELAY WIRING	2-15
System Start Relay	2-16
Fault Alarm Relay	2-16
Auxiliary Relay	2-16
2.13 4 – 20 mA WIRING	2-16
CHAPTER 3 - OPERATION	3-1
3.1 INTRODUCTION	3-1
3.2 FRONT PANEL OPERATING CONTROLS AND DISPLAYS	3-1
3.3 BMS II MENU STRUCTURE	3-3
Menu Processing Procedure	3-3
3.4 operating menu	3-5
HEADER TEMP and PERCENT OF LOAD	3-5
HEADER SETPOINT	3-5
OUTSIDE AIR TEMP	3-5
I/O STATUS	3-6
RETURN TEMP	3-6

CONTENTS

TABLE OF CONTENTS (cont.)

3.5 SETUP MENU	3-6
ENTER PASSWORD.....	3-6
Date and Time Menu Options.....	3-6
3.6 RS232 MENU.....	3-7
RS232 MODE.....	3-7
RS232 BAUD RATE.....	3-7
MODBUS ADDRESS.....	3-7
NETWORK TIMEOUT.....	3-7
MODBUS PASS THRU.....	3-7
3.7 RS485 MENU.....	3-7
RS485 BAUD RATE.....	3-8
MIN SLAVE ADDR.....	3-8
MAX SLAVE ADDR.....	3-8
NUMBER NETWK BLRS.....	3-8
MODBUS CNTL TYPE.....	3-8
NETW BOILER XX ADDRESS= YYY (Where XX = 01 – 32; YYY = 001 – 127).....	3-8
3.8 FIELD ADJUST MENU.....	3-8
HEADER SET MODE.....	3-8
HDR HIGH LIMIT.....	3-8
HDR LOW LIMIT.....	3-9
INTERNAL SETPT.....	3-9
RESET RATIO.....	3-9
BLDG REF TEMP.....	3-9
REMOTE SIGNAL.....	3-9
OFFSET ENABLE.....	3-9
Offset Menu Options.....	3-9
Setting Up An Offset Schedule.....	3-10
Manual Offset.....	3-10
3.9 CONFIGURATION MENU.....	3-10
BOILER OP MODE.....	3-10
SYS INTLK CONFIG.....	3-11
BLR START LEVEL.....	3-11
BLR STOP LEVEL.....	3-11
MAX POWER INPUT.....	3-11
FAIL SAFE MODE.....	3-11
3.10 TUNING MENU.....	3-12
PROPORTIONAL BND.....	3-12
INTEGRAL GAIN.....	3-12
DERIVATIVE GAIN.....	3-13
HDR TEMP DEADBND.....	3-13
3.11 RELAY MENU.....	3-13
SYS START TEMP.....	3-13
SYS START OPTION.....	3-13
SYS START INTLK.....	3-13
AUX RELAY OPEN.....	3-13
AUX RELAY CLOSE.....	3-13
FAULT ALRM RELAY.....	3-14
FAULT ALARM BLRS.....	3-14
FAULT ALRM CLEAR.....	3-14
3.12 CALIBRATION MENU.....	3-14
HDR SENS OFFSET.....	3-14
OUTD SENS OFFSET.....	3-14
4 - 20 MA OFFSET.....	3-14
RETN SENS OFFSET.....	3-14
RAMP UP %/MIN.....	3-14
RAMP DOWN %/MIN.....	3-15

CONTENTS

TABLE OF CONTENTS (cont.)

LOAD START PCT	3-15
LOAD STOP PCT	3-15
RESET DEFAULTS.....	3-15
3.13 BMS II QUICK-START GUIDE	3-15
CONSTANT SETPT MODE (Default)	3-16
REMOTE SETPT MODE	3-16
OUTDOOR RESET MODE.....	3-17
CHAPTER 4 - PROGRAMMING BMS II OPERATING MODES	4-1
4.1 INTRODUCTION	4-1
4.2 OUTDOOR RESET MODE.....	4-1
Selecting Outdoor Reset Mode	4-1
Determining Reset Schedule.....	4-2
Entering Reset Ratio And Building Reference Temperature	4-2
Selecting Boiler Operating Mode	4-2
Entering System Start Temperature	4-3
4.3 REMOTE SETPOINT MODE	4-3
Selecting Remote Setpoint Mode	4-3
Entering Header High Limit And Low Limit Temperatures	4-4
Selecting Remote Signal Type.....	4-4
Selecting Boiler Operating Mode	4-5
4.4 CONSTANT SETPOINT MODE	4-5
Selecting Constant Setpoint Mode.....	4-5
Selecting Internal Setpoint Temperature	4-6
Selecting Boiler Operating Mode	4-6
4.5 "TEMP AND LOAD" OPTION.....	4-6
4.6 "START ENABLED" OPTION.....	4-7
4.7 SYSTEM INITIALIZATION and polling.....	4-7
4.8 TESTING THE SYSTEM	4-7
CHAPTER 5 - TROUBLESHOOTING.....	5-1
5.1 FAULT MESSAGES & COMMON PROBLEMS	5-1
APPENDIX A - BMS MENUS	A-1
APPENDIX B - STATUS AND FAULT MESSAGES	B-1
APPENDIX C - METHODS FOR DETERMINING RESET SCHEDULE	C-1
APPENDIX D - NTC TEMPERATURE RESISTANCE CHART	D-1
APPENDIX E - BMS II WIRING DIAGRAM	E-1
APPENDIX F - BMS II PARTS AND ACCESSORIES	F-1
APPENDIX G - PROGRAMMING THE BMS II USING RS232 COMMUNICATION	G-1
APPENDIX H - BMS II MODBUS ADDRESS ASSIGNMENTS	H-1
APPENDIX I - BOILER START AND BOILER STOP LEVELS	I-1

CHAPTER 1 - GENERAL INFORMATION

1.1 SAFETY PRECAUTIONS & WARNINGS

1.2 INTRODUCTION

1.3 SYSTEM GENERAL DESCRIPTION

GENERAL INFORMATION

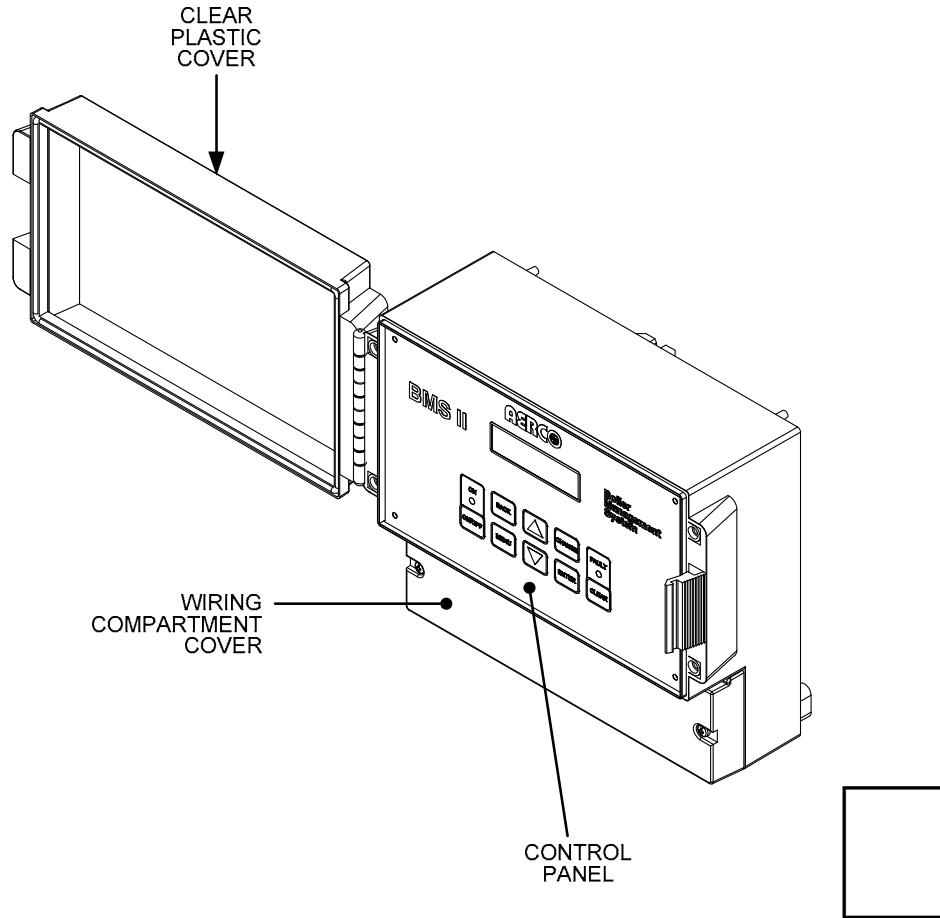


Figure 1-1. Boiler Management System II (BMS)

1.4 BMS II FEATURES

Simplified Start-Up

User-Editable Control Parameters

GENERAL INFORMATION

Retention of Menu Option Settings

Application of BMS II

Sequential or Parallel Operation

Boilers can be programmed for either sequential or parallel operation using the BMS II keypad controls. When set for sequential operation, the boilers are brought on-line one at a time as needed. When set for parallel operation, the boilers are all brought on-line at one time when the demand is high.

Appearance

Burner Settings

Fault Alarm Supervision

BMS II Programming Year 2000 Form

CHAPTER 2 - INSTALLATION

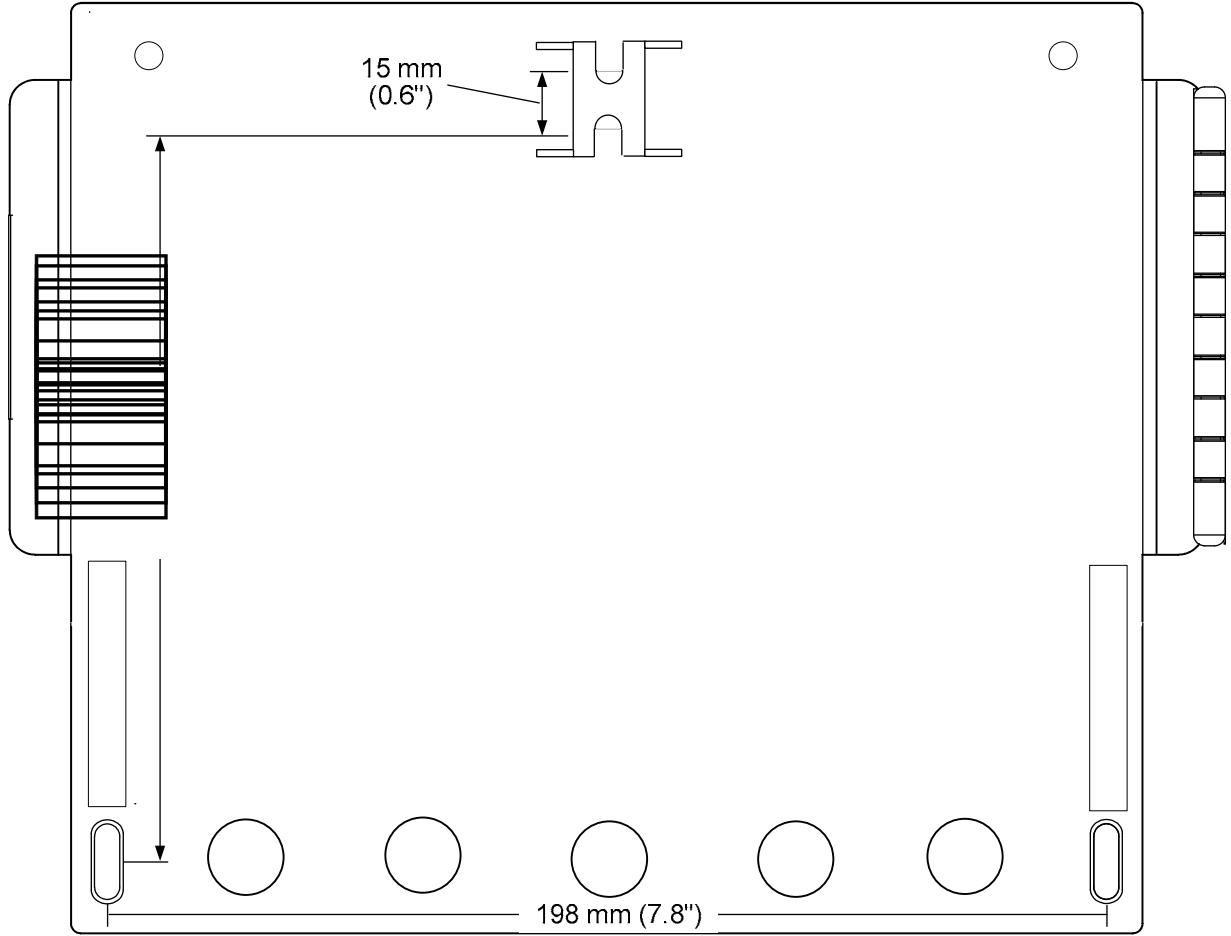
2.1 INTRODUCTION

2.2 SITE SELECTION AND MOUNTING

-
-

Mounting on a Wall

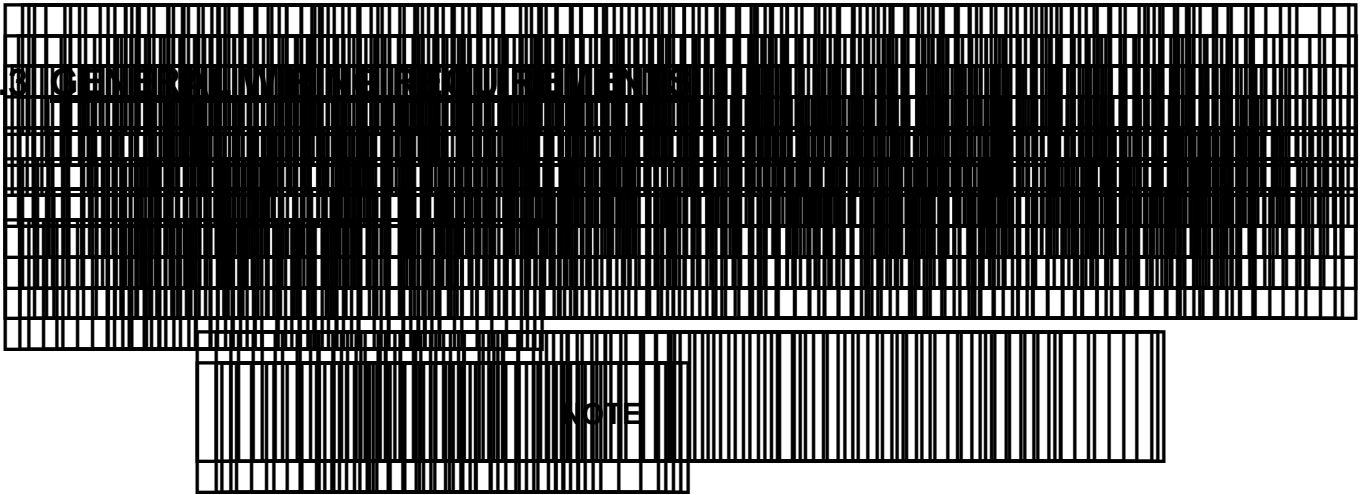
INSTALLATION

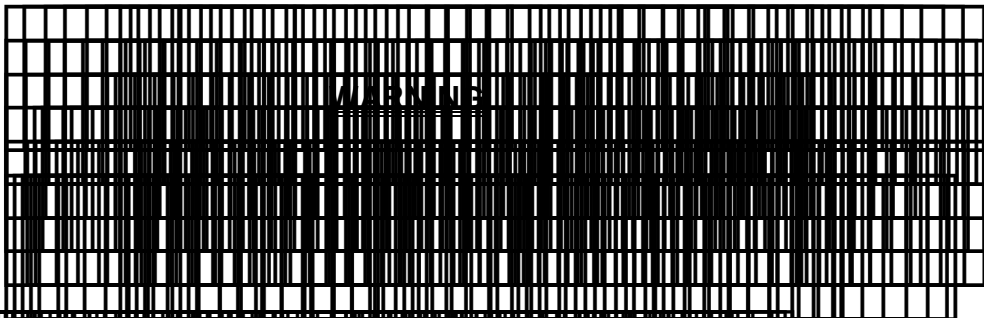


REAR VIEW

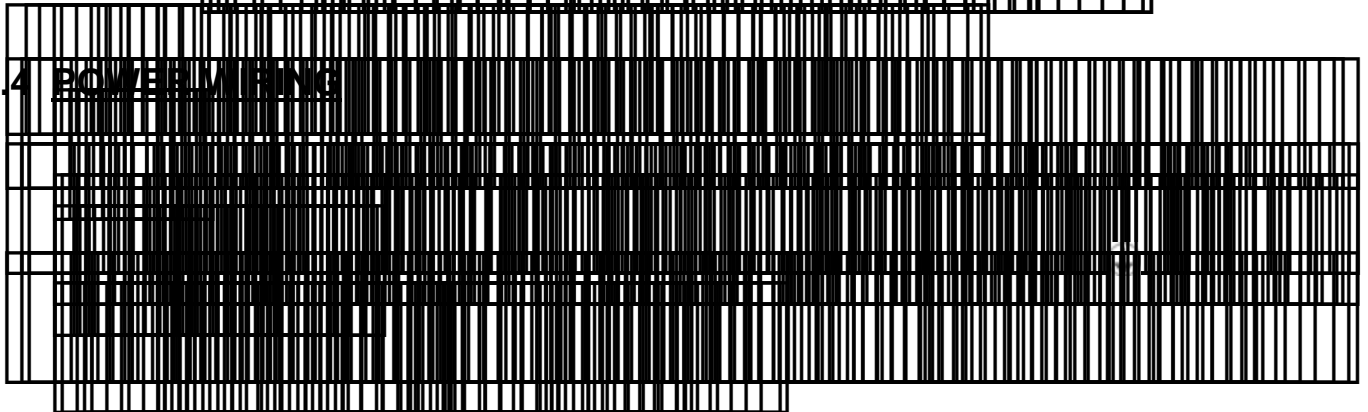
Figure 2-1. BMS II Mounting Provisions

2





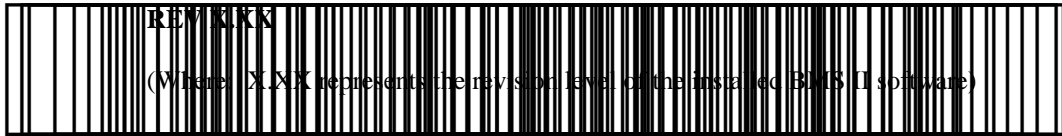
2.4 POWER WIRING



AERCO BMSII

REV XXX

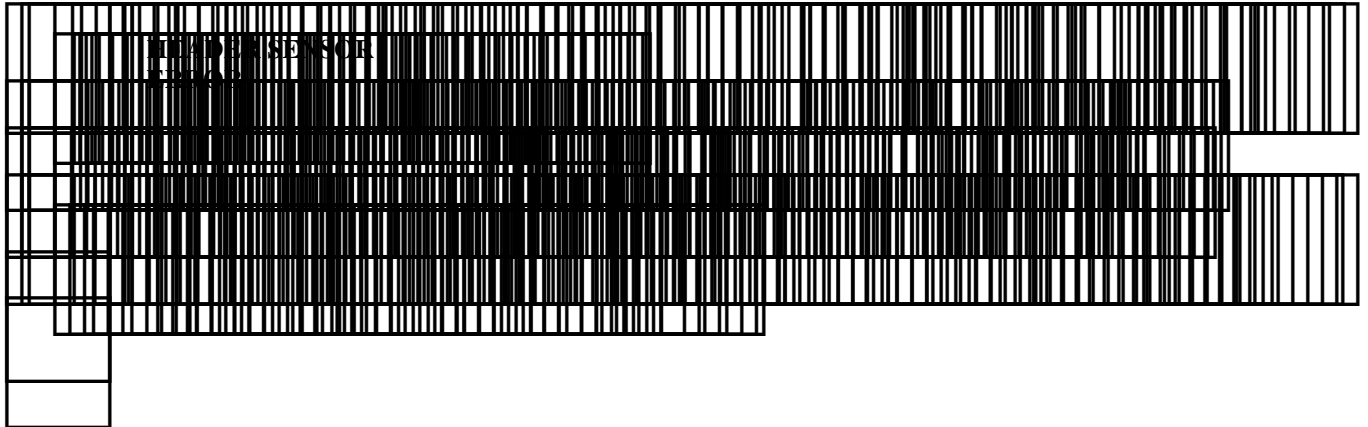
(Where XXX represents the revision level of the installed BMS II software)



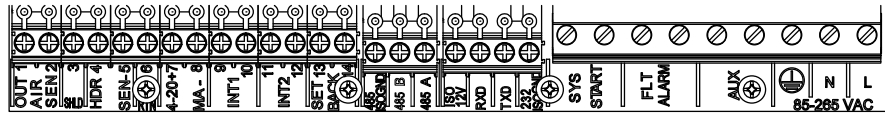
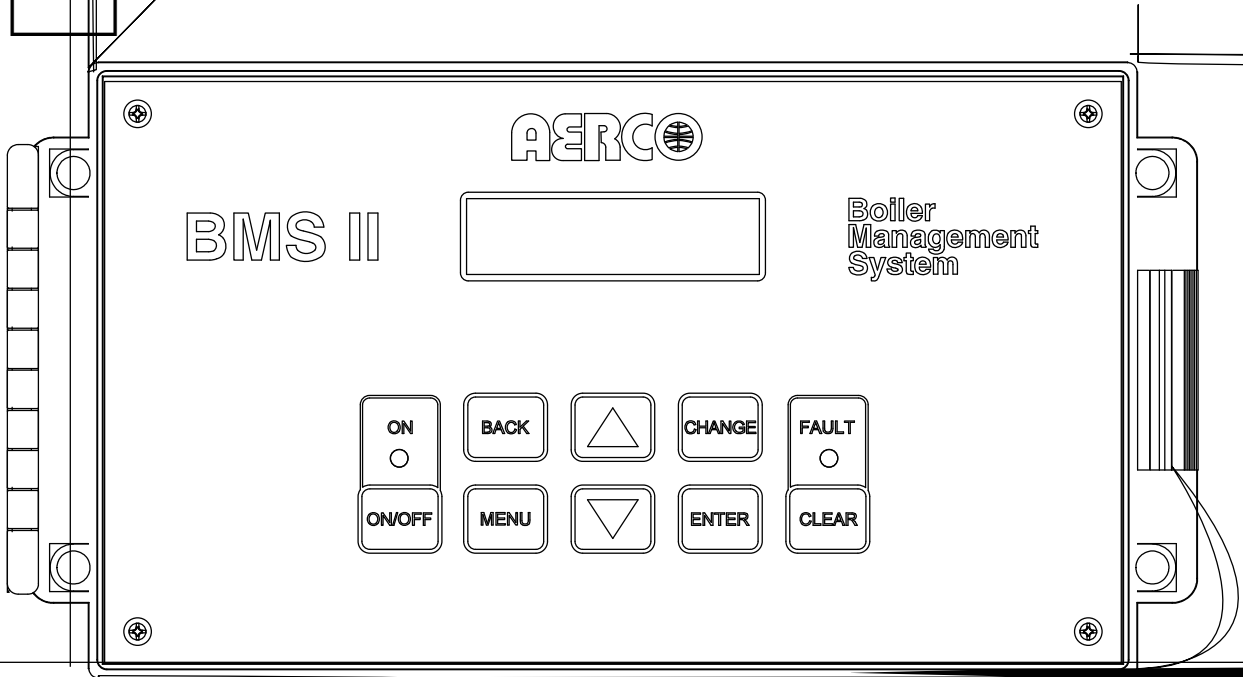
HEADER TEMP
SENSOR ERROR



HEADER SENSOR



INSTALLATION



2.5

INSTALLATION

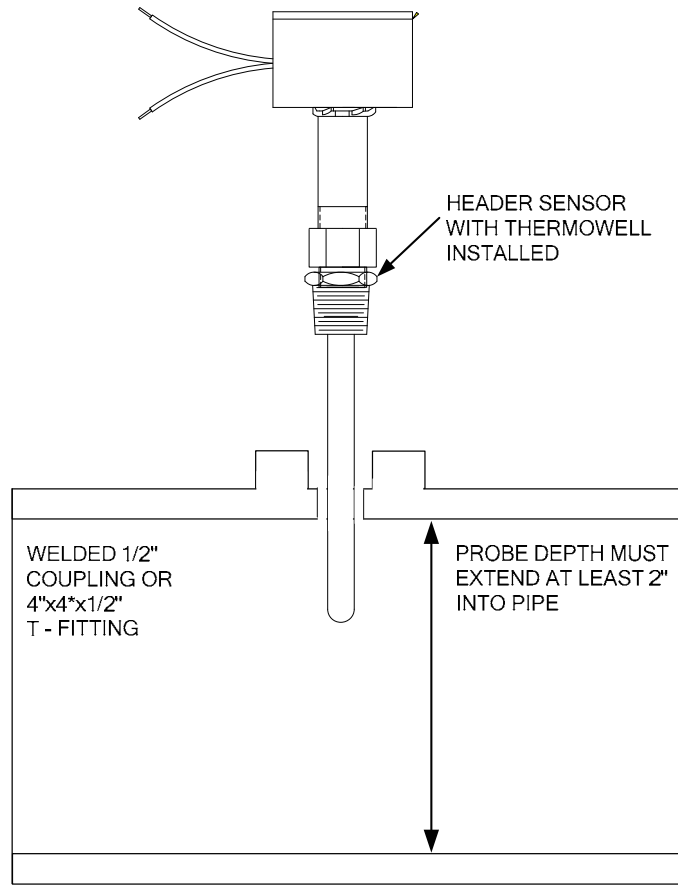
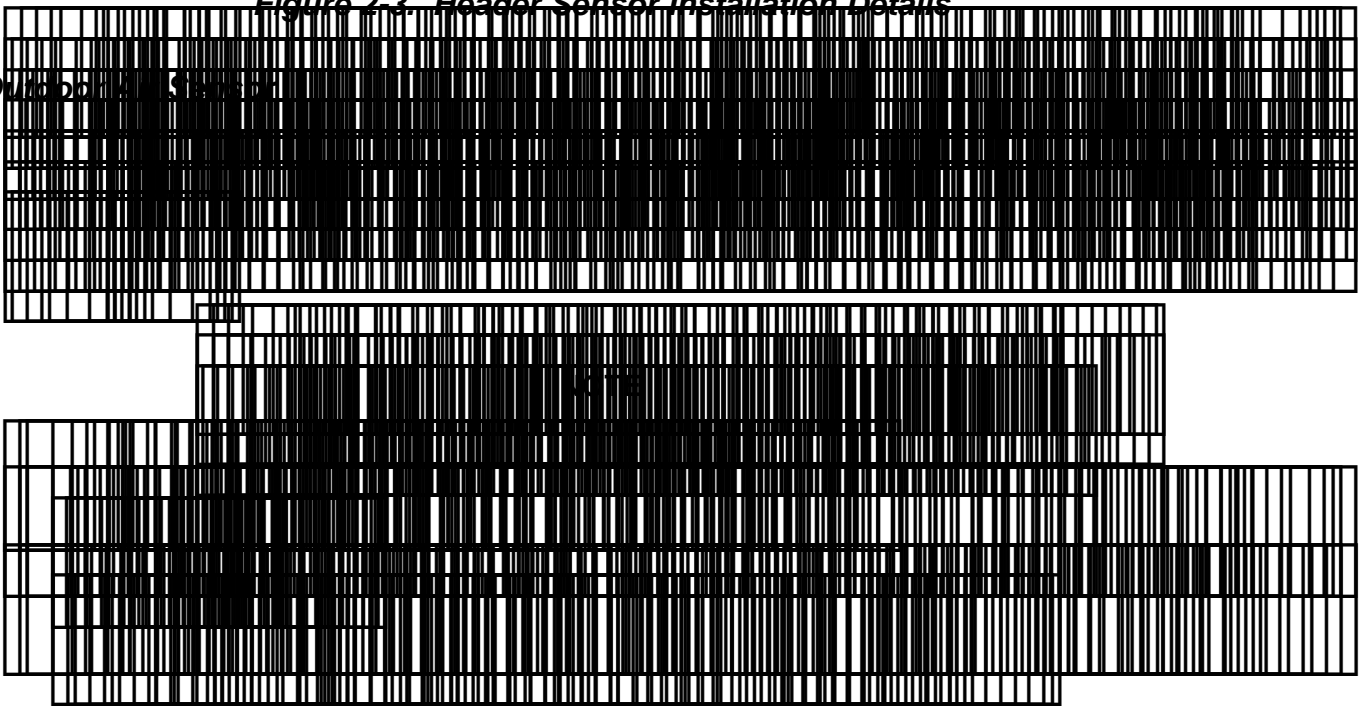


Figure 2-3 Header Sensor Installation Details

Outdoor Sensors



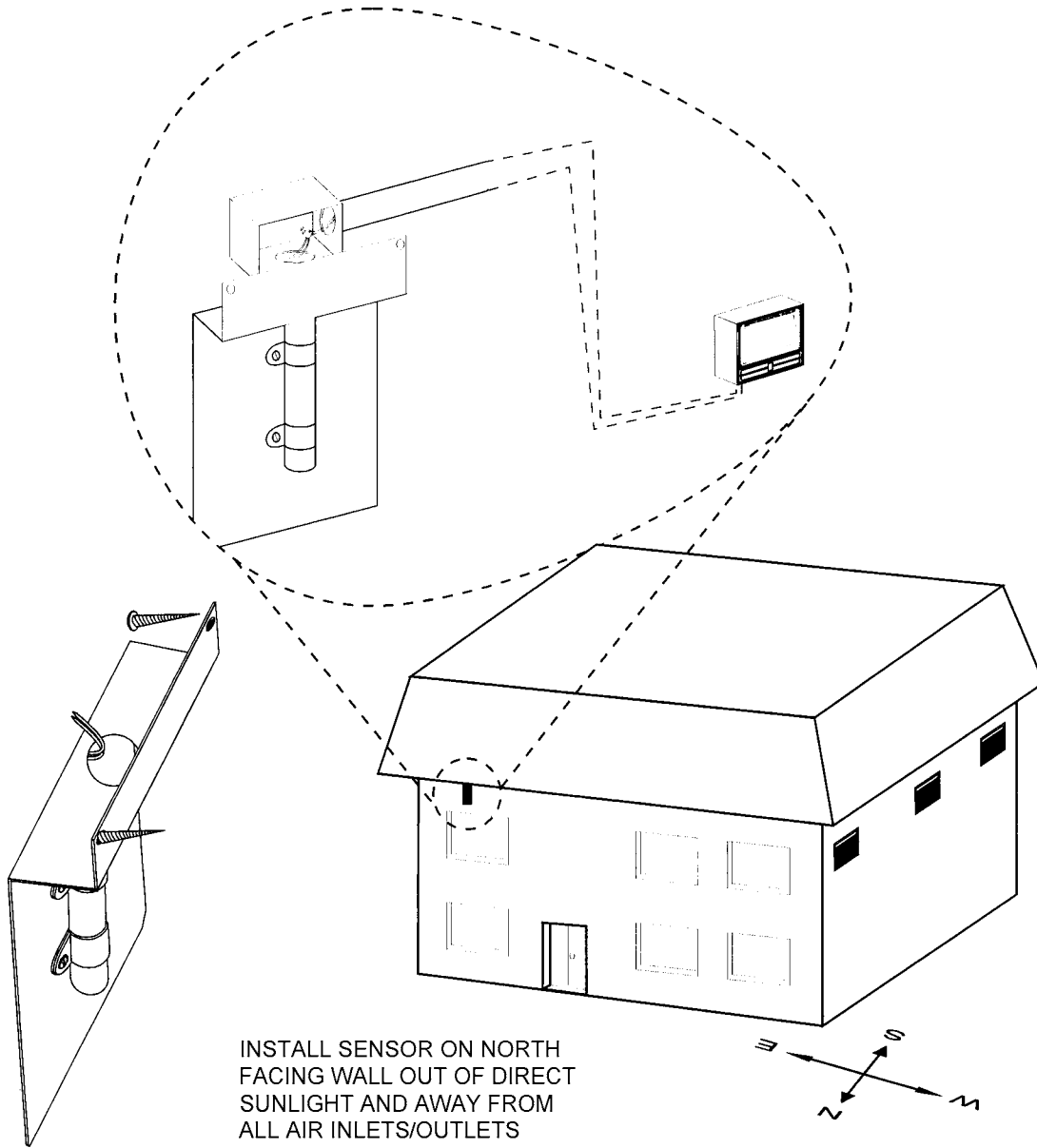
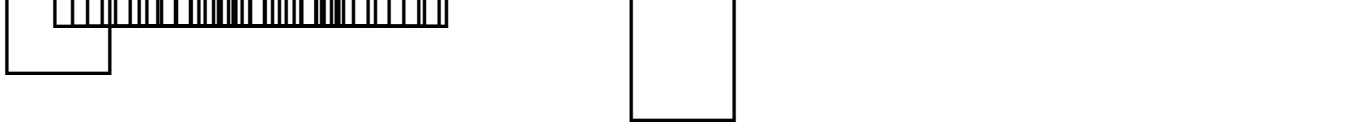


Figure 2-4. Outdoor Air Sensor Installation



INSTALLATION

2.6 RS-485 NETWORKS WITH DRAIN

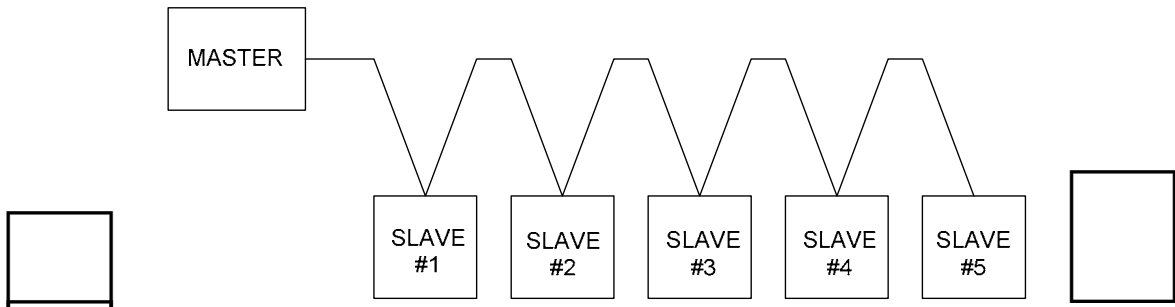
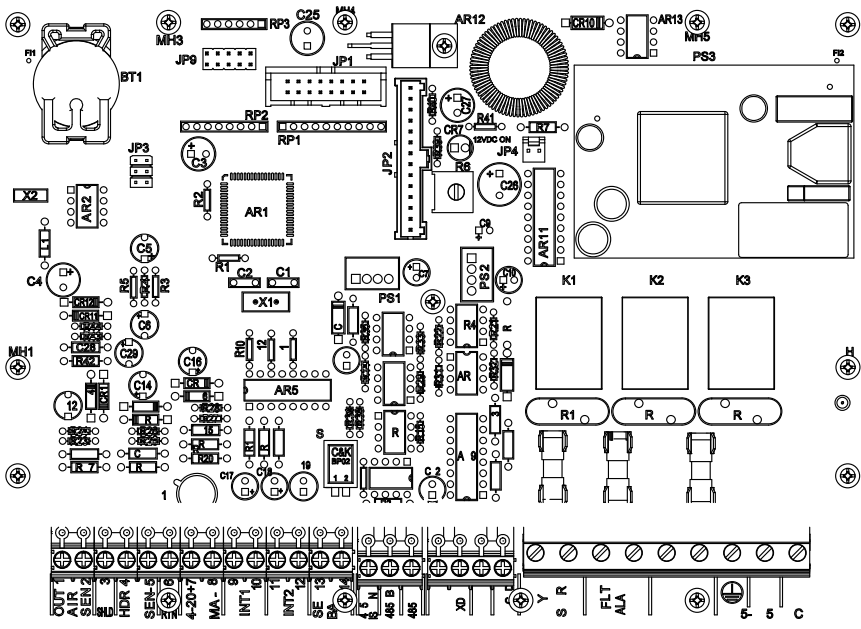


Figure 2-4. Typical Daisy Chain Modbus/RS-485 Network

485 A+

BVS BVS BVS BVS

INSTALLATION



INSTALLATION

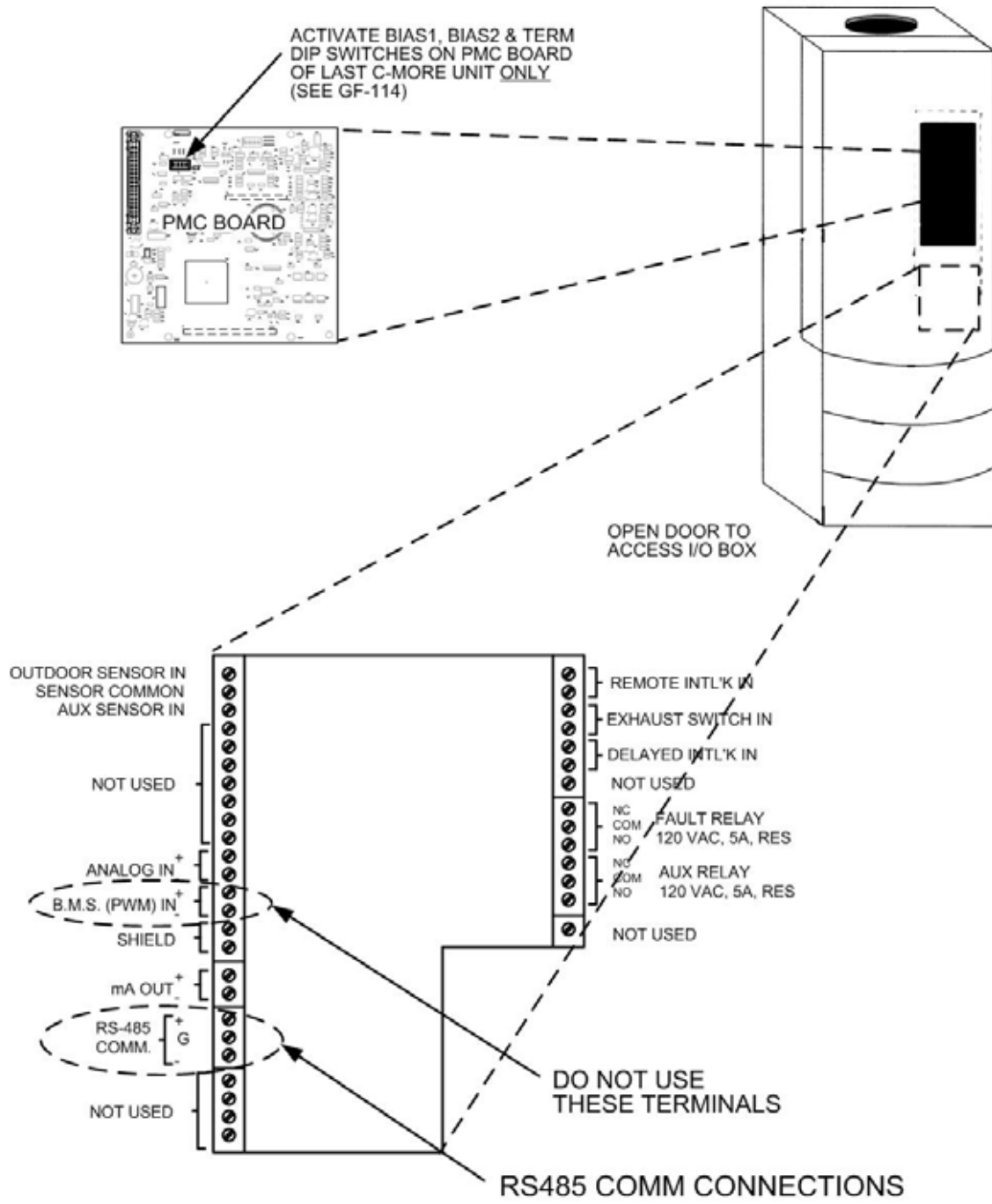


Figure 2-7. RS485 (Modbus) Wiring For Benchmark Series Boilers

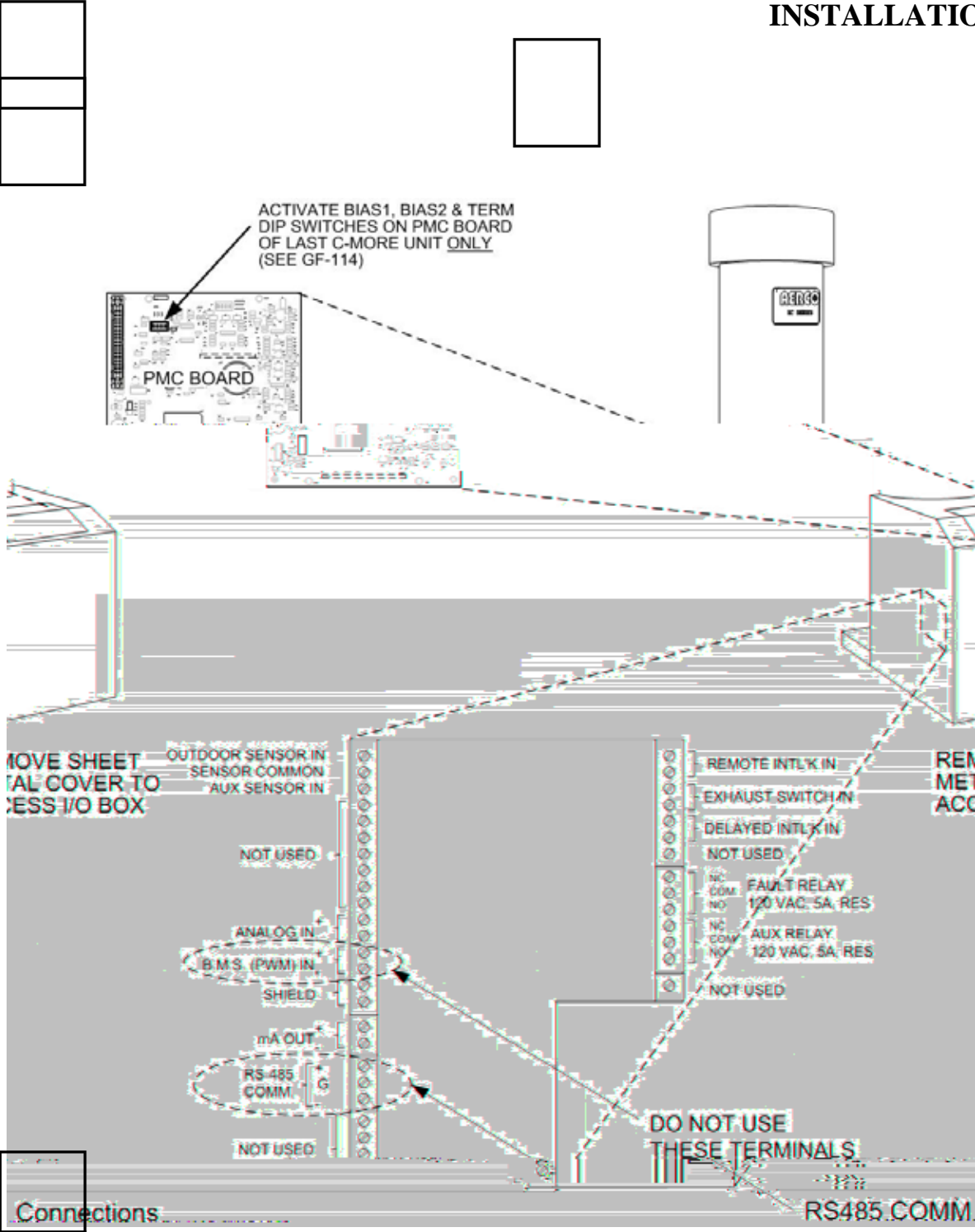


Figure 2-8. RS485 (Modbus) Wiring For KC1000 Boilers

RS485 Wiring for Modbus Series Boilers

INSTALLATION

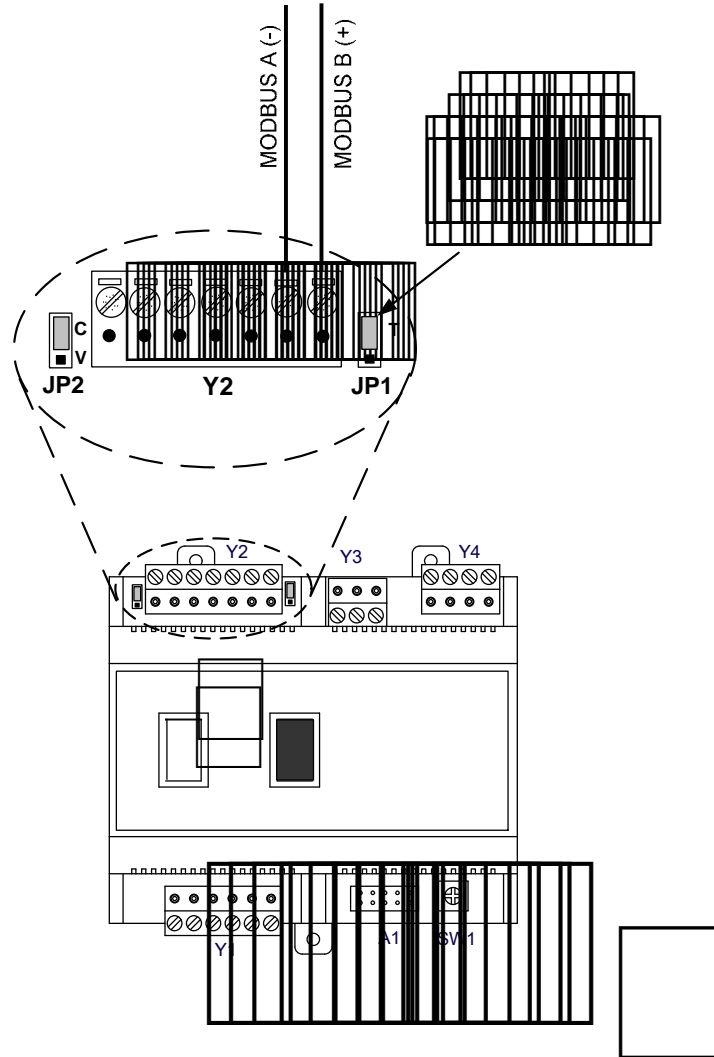


Figure 2-9. RS485 (Modbus) Wiring For Modulex Series Boilers

2.8 SAMPLE RS485 (MODBUS) NETWORK OVERVIEW

INSTALLATION

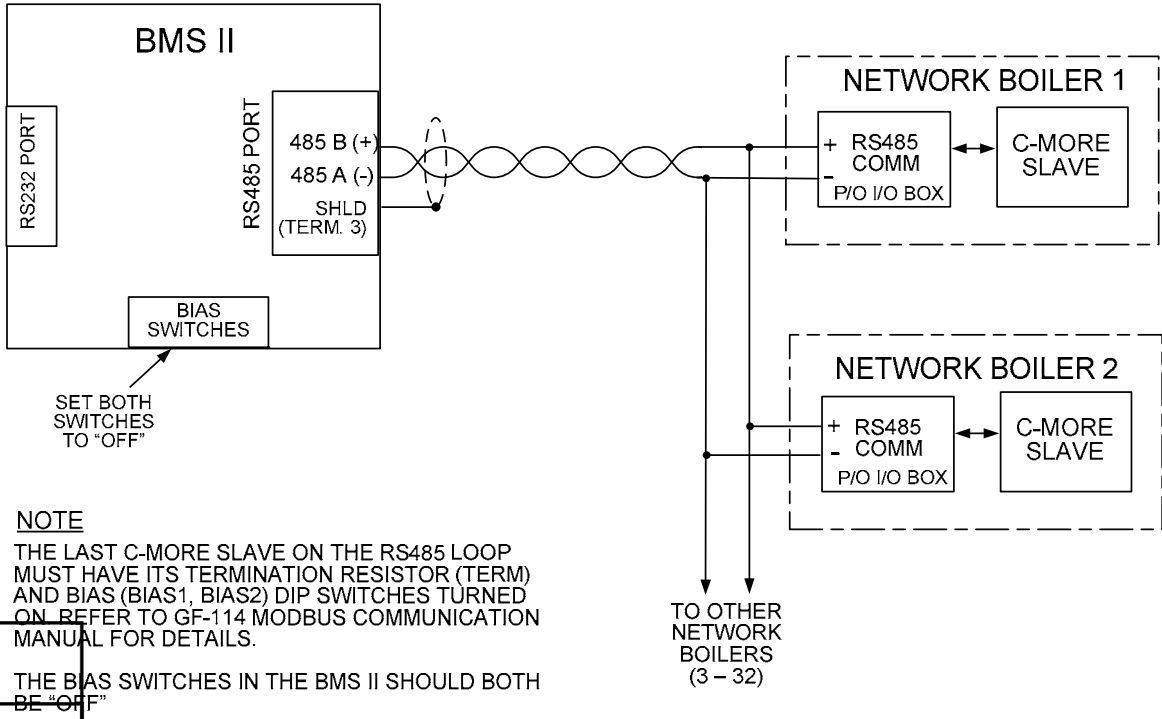


Figure 2-10. Sample RS485 (Modbus) Network For Benchmark or KC1000 Boilers

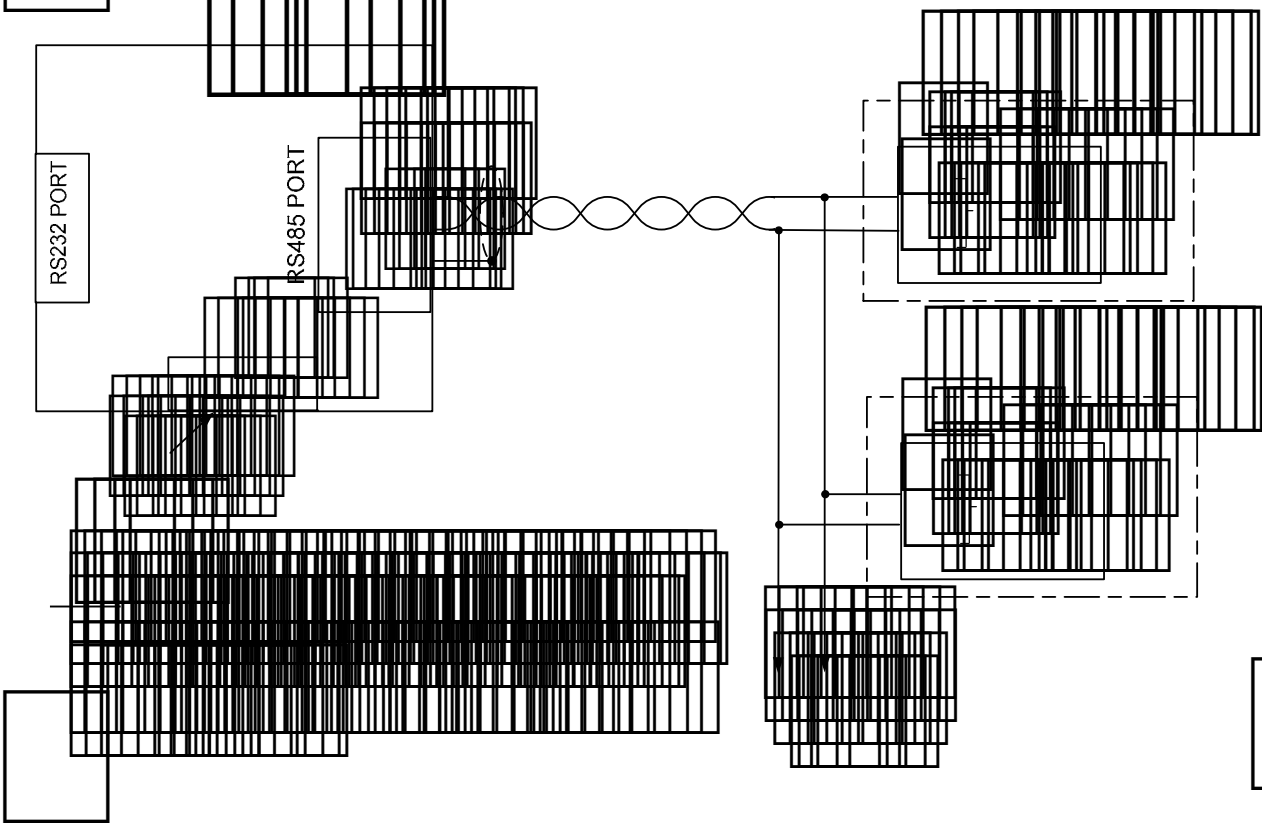


Figure 2-11. Sample RS485 (Modbus) Network For Modulex Series Boilers

INSTALLATION

2.9 RS485 NETWORK CONNECTIONS

IS-411

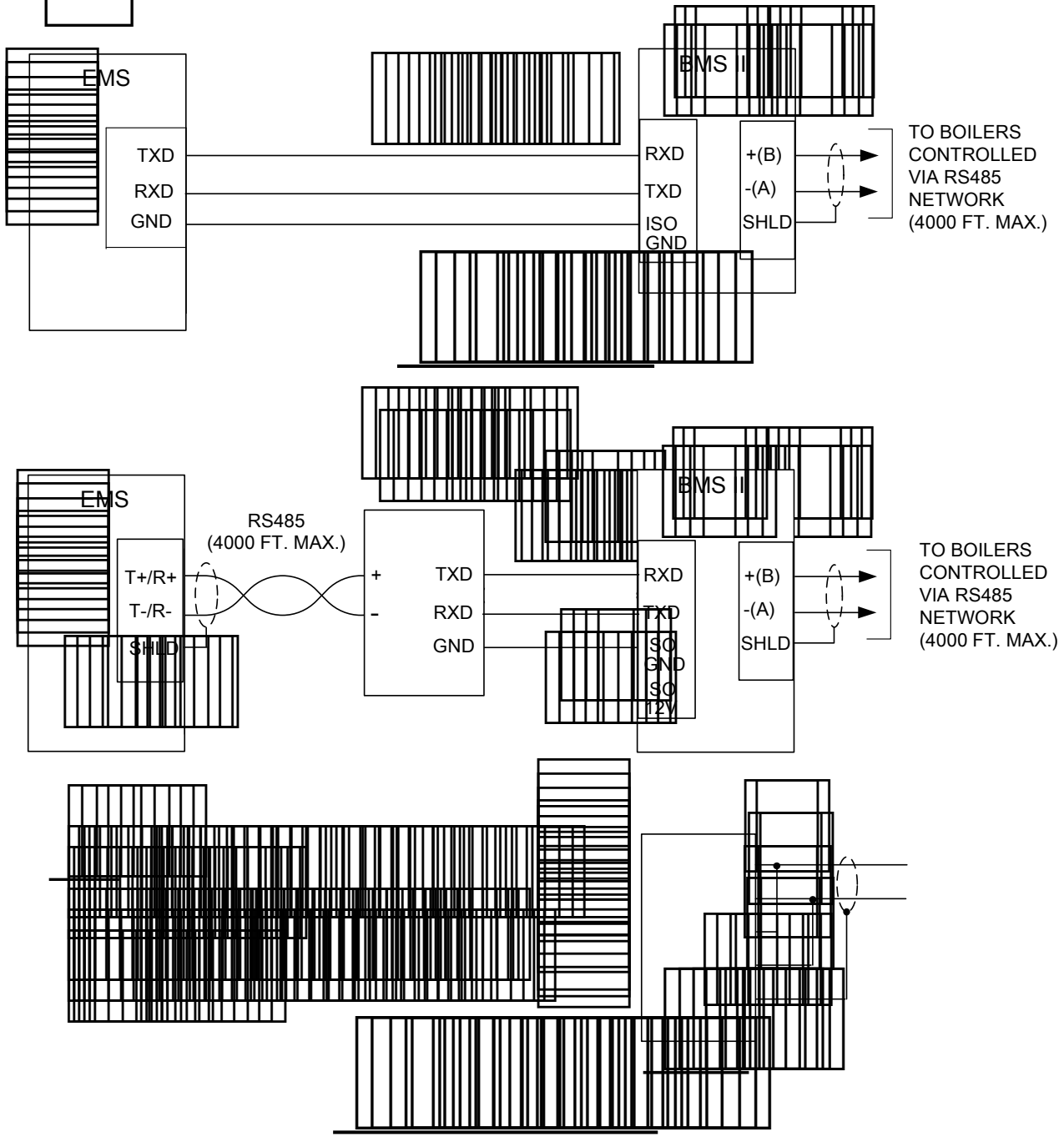
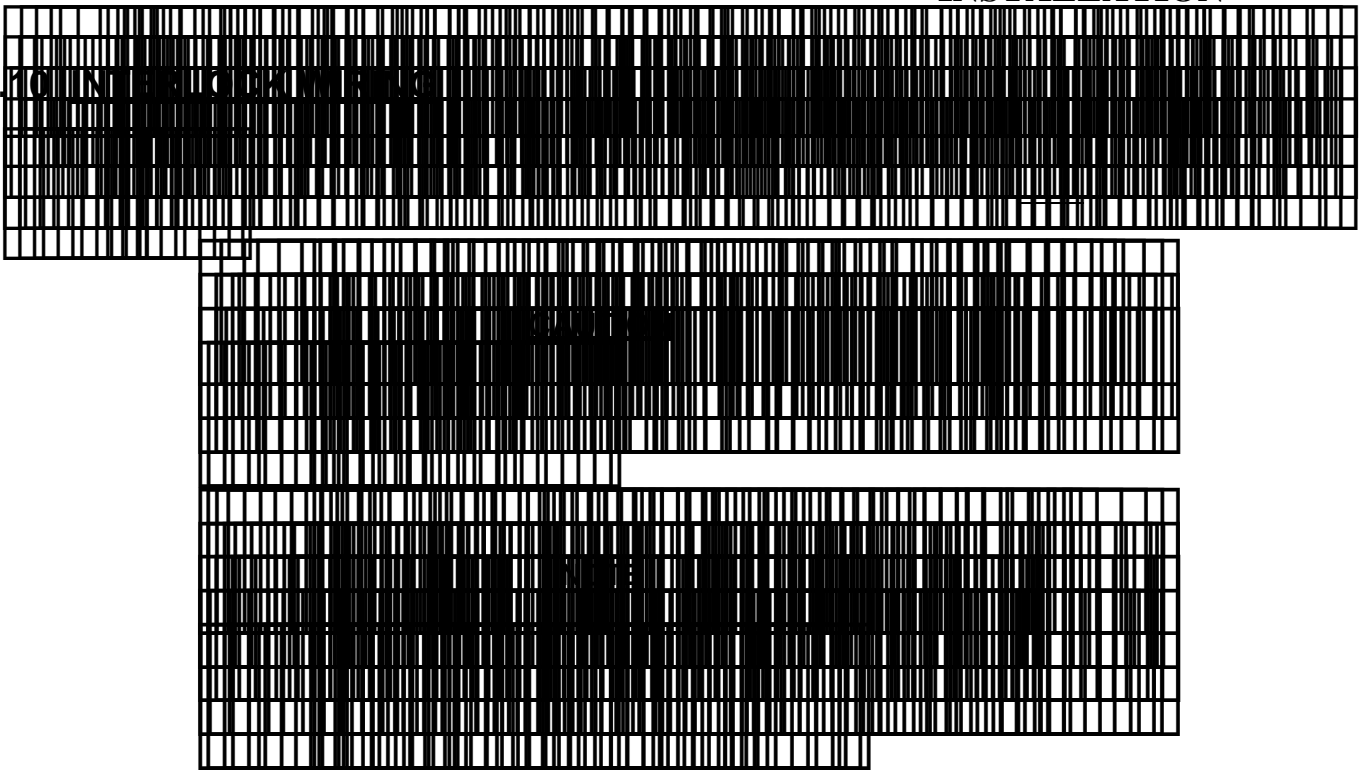
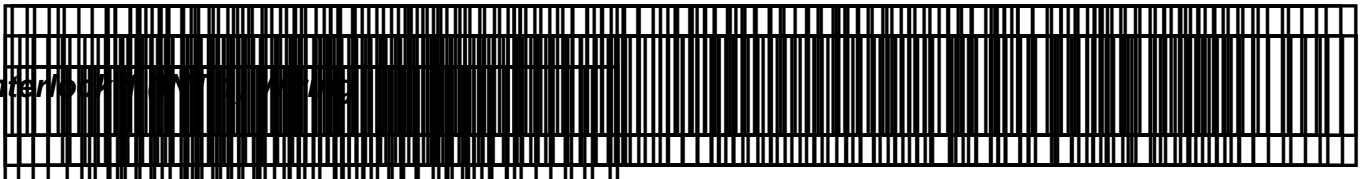


Figure 2-12. Sample Network Connections To EMS

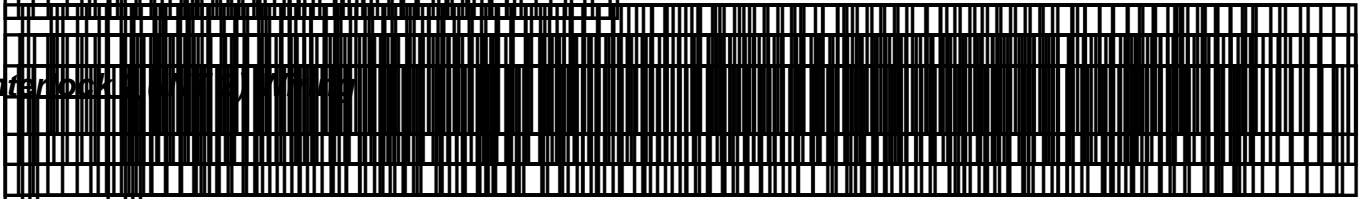
2.10



Interlock

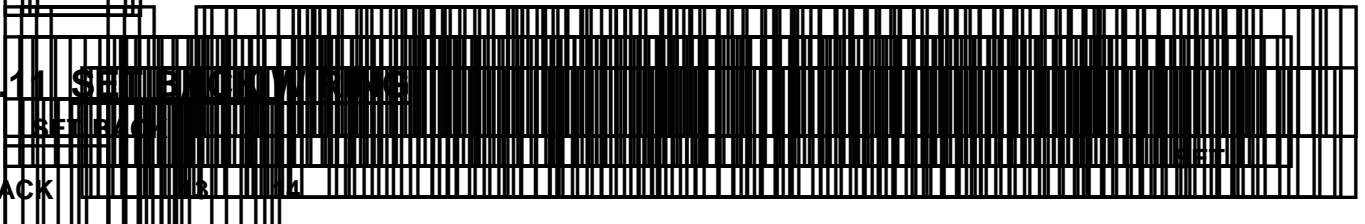


Interlock



2.11

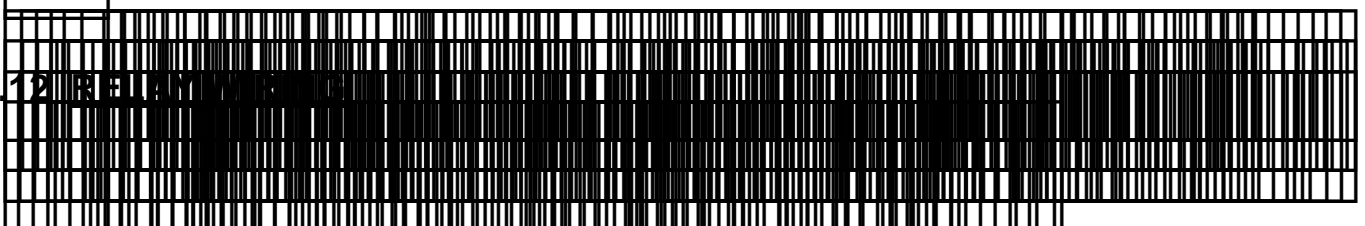
SETBACK WIRE



BACK

2.12

RELAY



INSTALLATION

NOTE

System Summary

Fault Alarm Details

Alarm Details

2-18 4-2014 W-2014

CHAPTER 3 - OPERATION

3.1	INTRODUCTION
3.2	FRONT PANEL OPERATING CONTROLS AND DISPLAYS

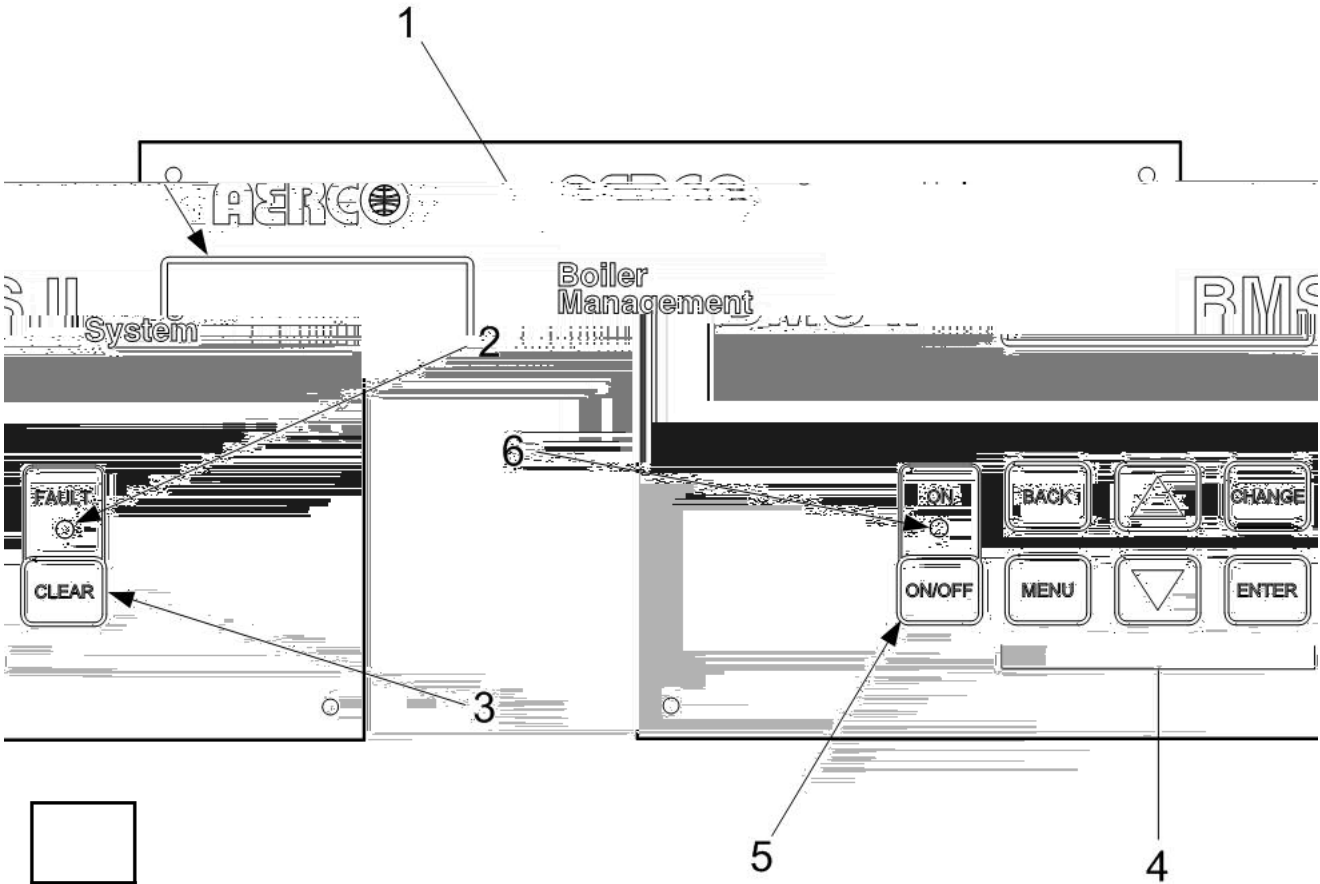
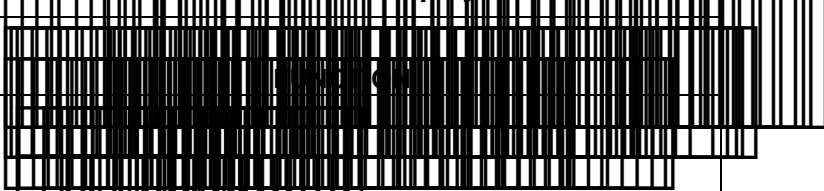
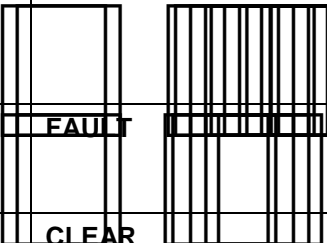

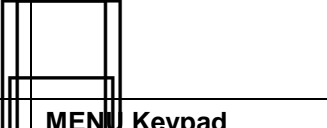

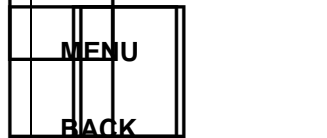




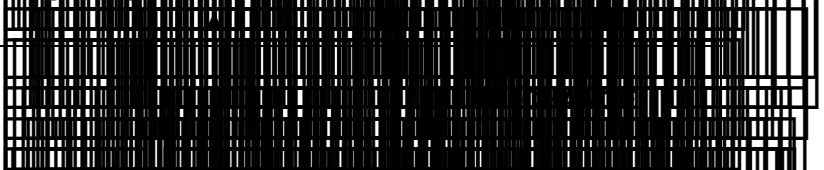
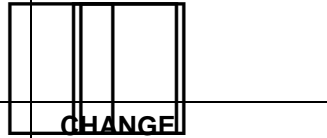
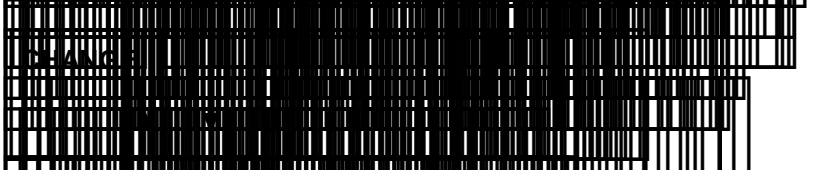
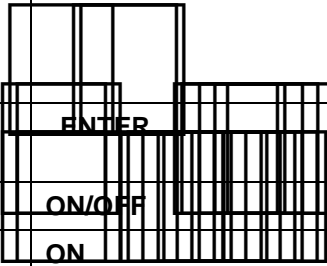
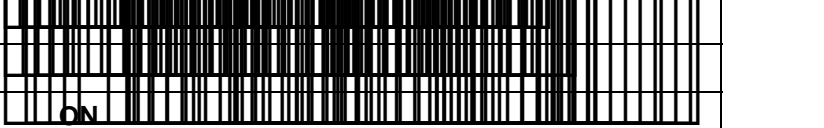


Figure 3-1. BMS II Front Panel Controls and Displays

OPERATION

Table 3-1. BMS II Front Panel Controls and Displays

CONTROL, INDICATOR OR DISPLAY	
	
	
	
	
	
	
	
	

3. BMS Menu Structure

-
-

Menu Processing Procedure

ENTER

OPERATION

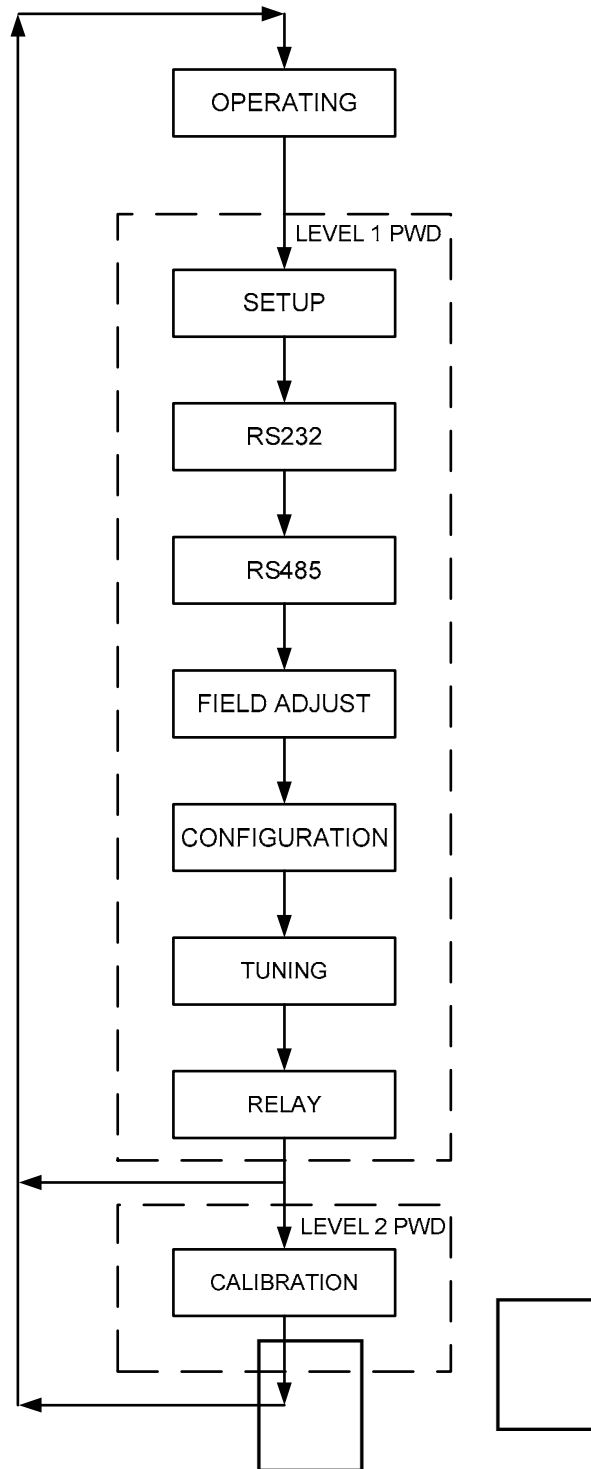


Figure 3-2. BMS II Menu Structure

OPERATION

3.4 OPERATING MEN

HEADER TEMP | HEADER SETPOINT | OUTSIDE AIR TEMP | PERCENT OF LOAD | HD STATUS |
 RETURN TEMP

HEADER TEMP and PERCENT OF LOAD

HEADER TEMP

HDR SEVS BRDF

PERCENT OF LOAD

HEADER SETPOINT

OUTSIDE AIR TEMP

OUTSIDE AIR TEMP

UNID CONNECTED

OPERATION

I/O STAFFS

I/O STAFFS

RETURN KEYS

RETURN KEYS

3.5 SET TIME

ENTER PASSWORD

ENTER PASSWORD

Date and Time Menu Options

- SET MONTH 01 -12
- SET DATE 01 - 31
- SET YEAR 00 - 99
- SET HOUR 00 -23
- SET MINUTE 00 - 59
- SET DAY OF WEEK SUNDAY TO SATURDAY

3.6 RS232 MENU

RS232 MODE
RS232 Baud Rate

RS232 MODE

RS232 MODE
RS232 Baud Rate

RS232 Baud Rate

RS232 Baud Rate
RS232 Baud Rate

MODBUS ADDRESS

MODBUS ADDRESS
MODBUS ADDRESS

NETWORK STATUS

NETWORK STATUS
NETWORK STATUS

MODEBUS PASS PHASE

MODEBUS PASS PHASE
MODEBUS PASS PHASE

3.7 RS485 MENU

RS485 MODE
RS485 Baud Rate
RS485 Address
RS485 Parity
RS485 Stop Bits
RS485 Data Bits
RS485 Flow Control
RS485 Handshake
RS485 Timeout
RS485 Error Handling
RS485 Test Mode
RS485 Help

OPERATION

RS485 BAUD RATE RS485 BAUD RATE	
MIN SLAVE ADDR MIN SLAVE ADDR	
MAX SLAVE ADDR MAX SLAVE ADDR	
NUMBER NETWORKS	
MODBUS RTU TYPE	<input type="checkbox"/> MODBUS <input type="checkbox"/> MODBUS+ <input type="checkbox"/> MODBUS-TCP <input type="checkbox"/> MODBUS-RTU
NETWORK ADDRESS	<input type="checkbox"/> UNICAST <input type="checkbox"/> BROADCAST <input type="checkbox"/> BROADCAST
NETWORK ADDRESS	<input type="checkbox"/> UNICAST <input type="checkbox"/> BROADCAST <input type="checkbox"/> BROADCAST
3.8 FIELD ADDRESS	
HEADER SET MODE HEADER SET MODE	
HDR HIGH LIMIT HDR HIGH LIMIT	
	HDR LOW LIMIT

HDR LOW LIMIT

HDR LOW LIMIT

TEMPERATURE LIMIT

INTERNAL SETPT

INTERNAL SETPT

HEADER SETPT

CONSTANT SETPT

HEADER SET MODE

CONSTANT SETPT

RESET RATIO

RATIO

RESET RATIO

MAX SETPT

BLDG REF TEMP

BLDG REF TEMP

HEADER SET MODE

OUTDOOR RESET

(BLDG REF TEMP)

REMOTE SIGNAL

REMOTE SIGNAL

HEADER SET MODE

REMOTE

OFFSET ENABLE

OFFSET ENABLE

Offset Menu Options

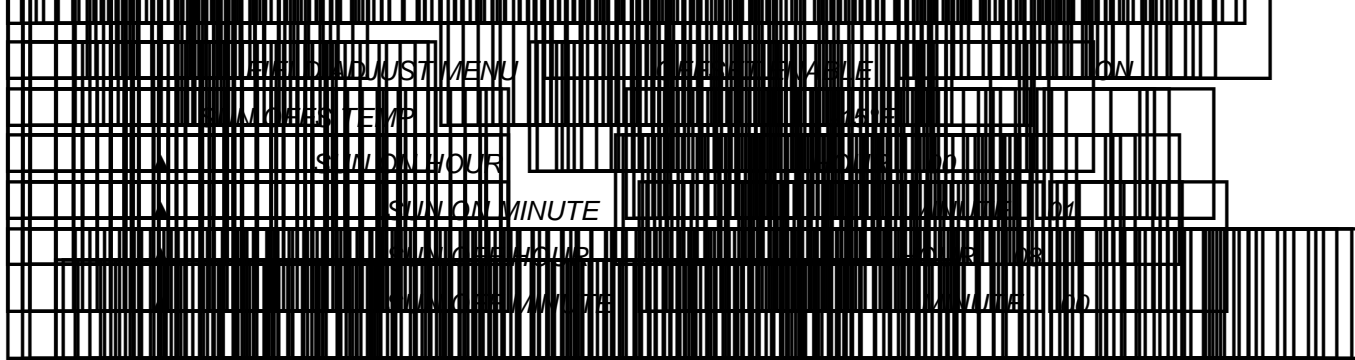
- OFFS TEMP
- ON HOUR (00 to 23)
- ON MINUTE (00 to 59)

• OFFS DUE (00 to 23)

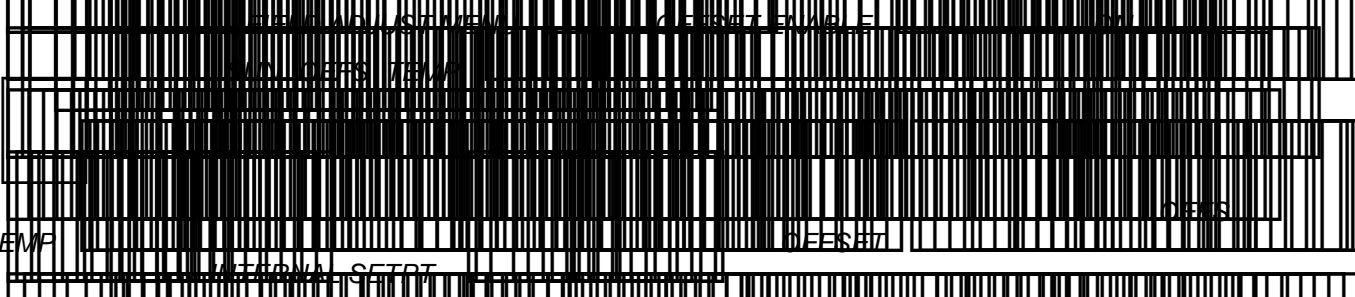
• OFFS DAY (00 to 31)

OPERATION

Safety (2) ON

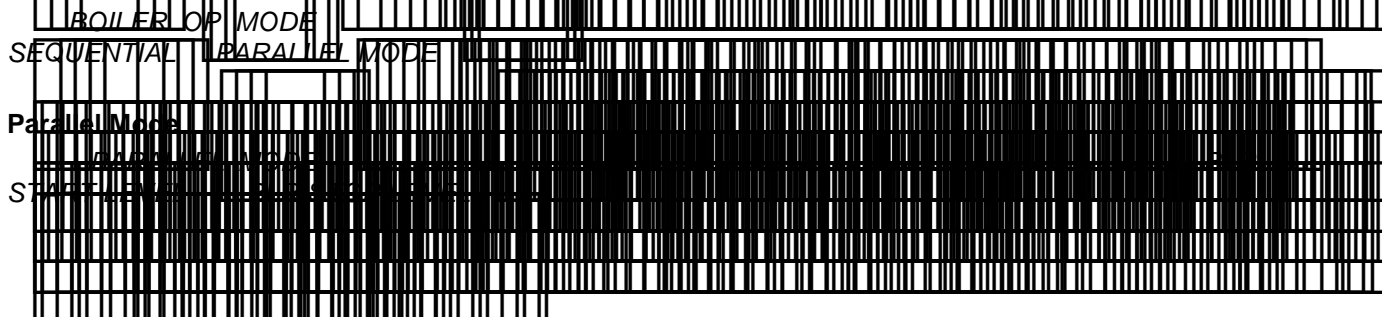


Manual Off Set



3.9 CONFIGURATION

BOILER OP MODE



OPERATION

3.10 TUNING MENU

TUNING MENU

PROPERTY MENU

INTEGRATION

DERIVATIVE CAN

HDR TEMP DEADBND

3.11 RELAY MENU

RELAY MENU

SYS START ENB

SYS START OPTION

SYS START OPTIO

LOAD START PCT

LOAD START PCT.

SYS START INTLK

SYS START INTLK

SYS INTLK CONFIG

INTERLOCK 2,

START ENABLED

INTERLOCK 1 (default),

INTERLOCK 1&2.

AUX RELAY OPEN

AUX RELAY OPEN

AUX RELAY CLOSE

OPERATION

FAULT ALARM RESET
FAULTS
INTERLOCK 1
FAULT ALARM BLRS
FAULT ALARM CLEER

3.12 CALIBRATION MENU

NOTE
HDR SENS OFFSET
OUTD SENS OFFSET
4-20 MA OFFSET
REFN SENS OFFSET
RAMP UP %/MIN

RAMP DOWN RATE		
LOAD START PCT		
SYS START OPTION	TEMP AND LOAD	
BLR START LEVEL		
LOAD STOP PCT		
SYS START OPTION	TEMP AND LOAD	
BLR STOP LEVEL		LOAD START PCT
RESET DEFAULTS		

3.13 BMS II QUICK-START GUIDE

OPERATION

CONSTANT SETPT MODE (Default)

MENU & OPTION	ACTION
1. SETUP MENU	
↓	
ENTER PASSWORD	
↓	
2. RS485 MENU	
↓	
NUMBER NETW BOILERS	
↓	
NETW BOILER 01	
ADDRESS=001	
↓	
3. FIELD ADJUST MENU	
↓	
INTERNAL SETPT	
↓	
4. CONFIGURATION MENU	BLP START LEVEL=20% & BLP STOP LEVEL=16%
↓	
BLP START LEVEL	
↓	
BLP STOP LEVEL	

REMOTE SETPT MODE

MENU & OPTION	ACTION
1. FIELD ADJUST MENU	
↓	
HEADER SET MODE	REMOTE SETPT
↓	
HDR HIGH LIMIT	
↓	
HDR LOW LIMIT	
↓	
REMOTE SIGNAL	
↓	
2. CONFIGURATION MENU	
↓	
FAIL SAFE MODE	CONSTANT SETPT
	SHUT(DOWN)

OUTDOOR RESET MODE

MENU & OPTION

1. RELADJUST MENU

HEADER SET MODE

RESET RATIO

BLDG REE TEMP

2. CONFIGURATION MENU

EAM SAFE MODE

3. RELAY MENU

BOYS START TEMP

ACTION

OUTDOOR RESET

CONSTANT SET PT

(SHUT/DOWN)

RELAY

CHAPTER 4 - PROGRAMMING BMS II OPERATING MODES

4.1

[Redacted]

[Redacted]

4.2

[Redacted]

-

[Redacted]

-

[Redacted]

Selecting Outdoor Reset Mode

[Redacted]

```
... REFRIG/COOL REFRIG/HEAT REFRIG/HEAT/COOL REFRIG/HEAT/COOL/DR/ANBE  
... REFRIG/COOL REFRIG/HEAT REFRIG/HEAT/COOL REFRIG/HEAT/COOL/DR/ANBE  
... REFRIG/COOL REFRIG/HEAT REFRIG/HEAT/COOL REFRIG/HEAT/COOL/DR/ANBE  
OUTDOOR RESET [ ] REFRIG/COOL REFRIG/HEAT REFRIG/HEAT/COOL REFRIG/HEAT/COOL/DR/ANBE
```

PROGRAMMING BMS II

Determining BMS II Status

Entering Basic Data Menu Building Reference Temperature

Selecting Basic Data Menu

Entering System Start Temp

TEMP SYSTEM START

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

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TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

4.0 REMOTE SETPOINT MODE

•

○

○

○

○

•

Selecting Remote Setpoint Mode

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

TEMP SYSTEM START TEMP

PROGRAMMING RMS II

ENTER

FIELD

ADJUST MENU

Entering Reader High Limit And Low Limit Temperatures

ENTER

ENTER

ENTER

ENTER

ENTER

ENTER

ENTER

FIELD ADJUST MENU

ENTER

HDR HIGH LIMIT

HDR LOW LIMIT

Selecting Reader Signal Type

ENTER

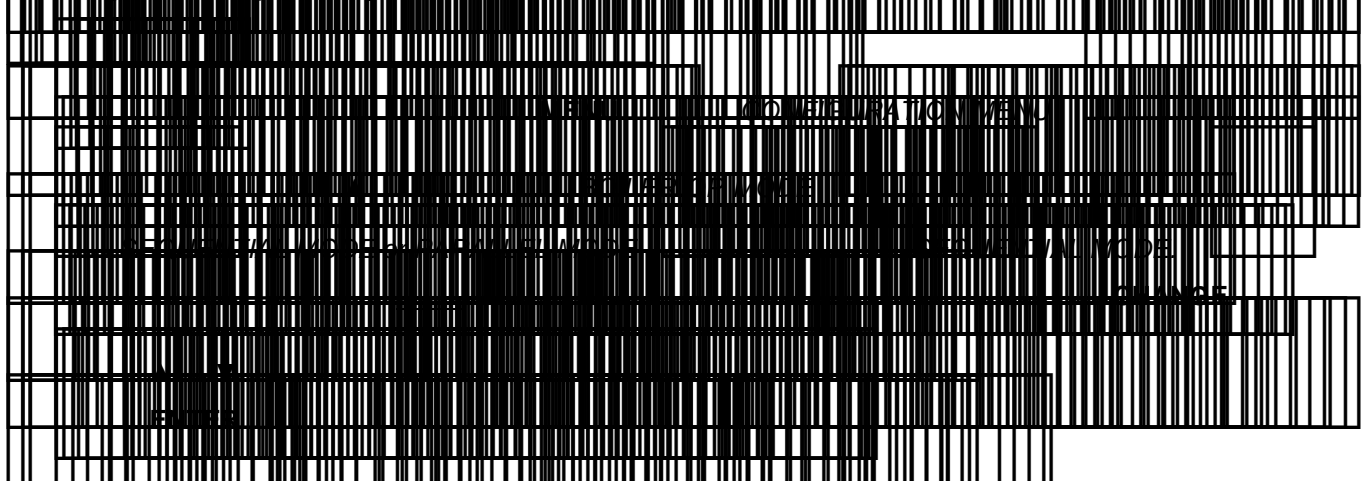
ENTER

ENTER

ENTER

CHANGE

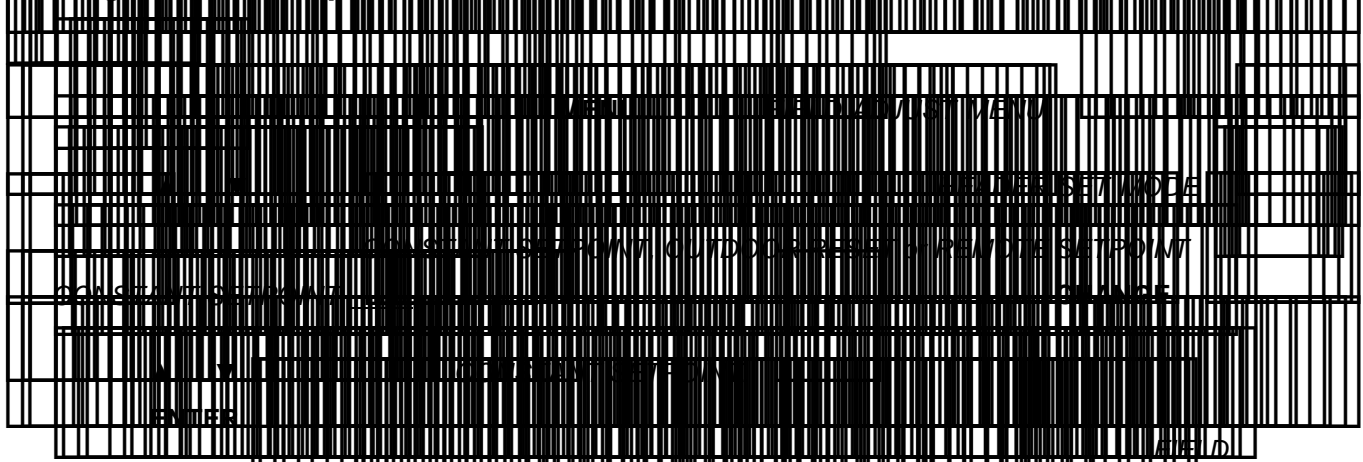
Selecting Bolt-Downing Mode



4.4 CONSTANT SETPOINT MODE

-
-
-

Selecting Constant Setpoint Mode



ADJUST MENU,

FIELD

PROGRAMMING BMS II

Selecting Soft Setpoint Temperature

MODEM SETUP

STREET SETUP

START

SETPOINT

Selecting Soft Heating Mode

MODEM SETUP

MODEM DURATION MENU

HEATING MODE

HEATING MODE CHANGE

MODEM SETUP

4.8.1 HEATING MODE

MODEM SETUP

MODEM DURATION MENU

HEATING MODE

HEATING MODE CHANGE

MODEM SETUP

PERCENT OF LOAD

LOAD

START TEMP.

PERCENT OF LOAD

INITIAL STOP PCT.

PERCENT OF LOAD

LOAD START PCT.

PERCENT OF LOAD

LOAD STOP PCT.

PROGRAMMING BMS II

4.6 START ENABLE DETECTION

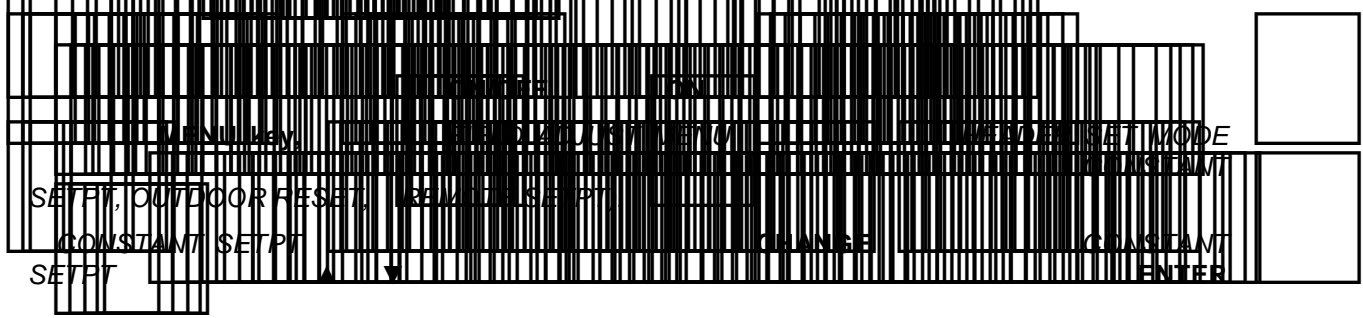
START ENABLE DETECTION
 BMS START IN TLK

4.7 SYSTEM INITIALIZATION AND BOILING

INITIALIZATION AND BOILING
 BOILING

4.8 TESTING THE SYSTEM

TESTING THE SYSTEM
 WEATHER SET MODE
 INTERNAL SETPT



PROGRAMMING BASICS II

Week	Topic
1	Introduction to C++
2	Variables and Data Types
3	Arithmetic Operations
4	Control Structures: if, switch
5	Control Structures: for, while, do-while
6	Arrays
7	Strings
8	Pointers
9	Structures and Unions
10	Enumerations
11	File Handling
12	Recursion
13	Complex Numbers
14	Complex Numbers
15	Complex Numbers
16	Complex Numbers
17	Complex Numbers
18	Complex Numbers
19	Complex Numbers
20	Complex Numbers
21	Complex Numbers
22	Complex Numbers
23	Complex Numbers
24	Complex Numbers
25	Complex Numbers
26	Complex Numbers
27	Complex Numbers
28	Complex Numbers
29	Complex Numbers
30	Complex Numbers
31	Complex Numbers
32	Complex Numbers
33	Complex Numbers
34	Complex Numbers
35	Complex Numbers
36	Complex Numbers
37	Complex Numbers
38	Complex Numbers
39	Complex Numbers
40	Complex Numbers
41	Complex Numbers
42	Complex Numbers
43	Complex Numbers
44	Complex Numbers
45	Complex Numbers
46	Complex Numbers
47	Complex Numbers
48	Complex Numbers
49	Complex Numbers
50	Complex Numbers
51	Complex Numbers
52	Complex Numbers
53	Complex Numbers
54	Complex Numbers
55	Complex Numbers
56	Complex Numbers
57	Complex Numbers
58	Complex Numbers
59	Complex Numbers
60	Complex Numbers
61	Complex Numbers
62	Complex Numbers
63	Complex Numbers
64	Complex Numbers
65	Complex Numbers
66	Complex Numbers
67	Complex Numbers
68	Complex Numbers
69	Complex Numbers
70	Complex Numbers
71	Complex Numbers
72	Complex Numbers
73	Complex Numbers
74	Complex Numbers
75	Complex Numbers
76	Complex Numbers
77	Complex Numbers
78	Complex Numbers
79	Complex Numbers
80	Complex Numbers
81	Complex Numbers
82	Complex Numbers
83	Complex Numbers
84	Complex Numbers
85	Complex Numbers
86	Complex Numbers
87	Complex Numbers
88	Complex Numbers
89	Complex Numbers
90	Complex Numbers
91	Complex Numbers
92	Complex Numbers
93	Complex Numbers
94	Complex Numbers
95	Complex Numbers
96	Complex Numbers
97	Complex Numbers
98	Complex Numbers
99	Complex Numbers
100	Complex Numbers

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

TROUBLESHOOTING



Table 5-1. Fault Messages – Continued

Fault Message	Description & Possible cause



TROUBLESHOOTING

Table 5-2 Common Problems

Problem	Possible Causes	Solutions
Boiler plant not started by BMS II	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] 	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED]
BMK or KC Boiler with C-More Control Box not being recognized by BMS II.	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] 	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED]
Modulex Boiler with BCM Control not being recognized by BMS II.	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] 	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED]
BMS II controlling boilers. EMS can see BMS II, but cannot see boilers.	<ul style="list-style-type: none"> • MODBUS MASTER • [REDACTED] 	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED]



TROUBLESHOOTING

Table 5-2 Common Problems - Continued

Problem	Possible Causes	Solution
EMS cannot see BMSII	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] 	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED]
Boiler RAMP UP or RAMP DOWN too slow or too fast	<ul style="list-style-type: none"> • RAMP UP / RAMP DOWN [REDACTED] • [REDACTED] 	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED]
HEADER TEMPERATURE not reaching Setpoint	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] 	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED]
Need to restore Factory Default Settings.	<ul style="list-style-type: none"> • [REDACTED] 	<ul style="list-style-type: none"> • [REDACTED]
Boilers over-shooting setpoint or tripping aquastat	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED] 	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] • [REDACTED]
Modbus Network faults encountered. Boiler plant not operating	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] 	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED]

APPENDIX A

BMS II MENUS

MENU LEVEL & OPTION	AVAILABLE CHOICES OR LIMITS		DEFAULT
	MINIMUM	MAXIMUM	
<u>OPERATING MENU</u>			
<u>SETUP MENU</u>			
<u>RS232 MENU</u>			

APPENDIX A

BMS II MENUS - Continued

MENU LEVEL & OPTION	AVAILABLE CHOICES OR LIMITS		DEFAULT
	MINIMUM	MAXIMUM	
FIELD ADJUST MENU - Cont.			
CONFIGURATION MENU			
TUNING MENU			

BMS II MENUS - Continued

MENU LEVEL & OPTION	AVAILABLE CHOICES OR LIMITS		DEFAULT
	MINIMUM	MAXIMUM	
RELAY MENU			
CALIBRATION MENU			

APPENDIX B

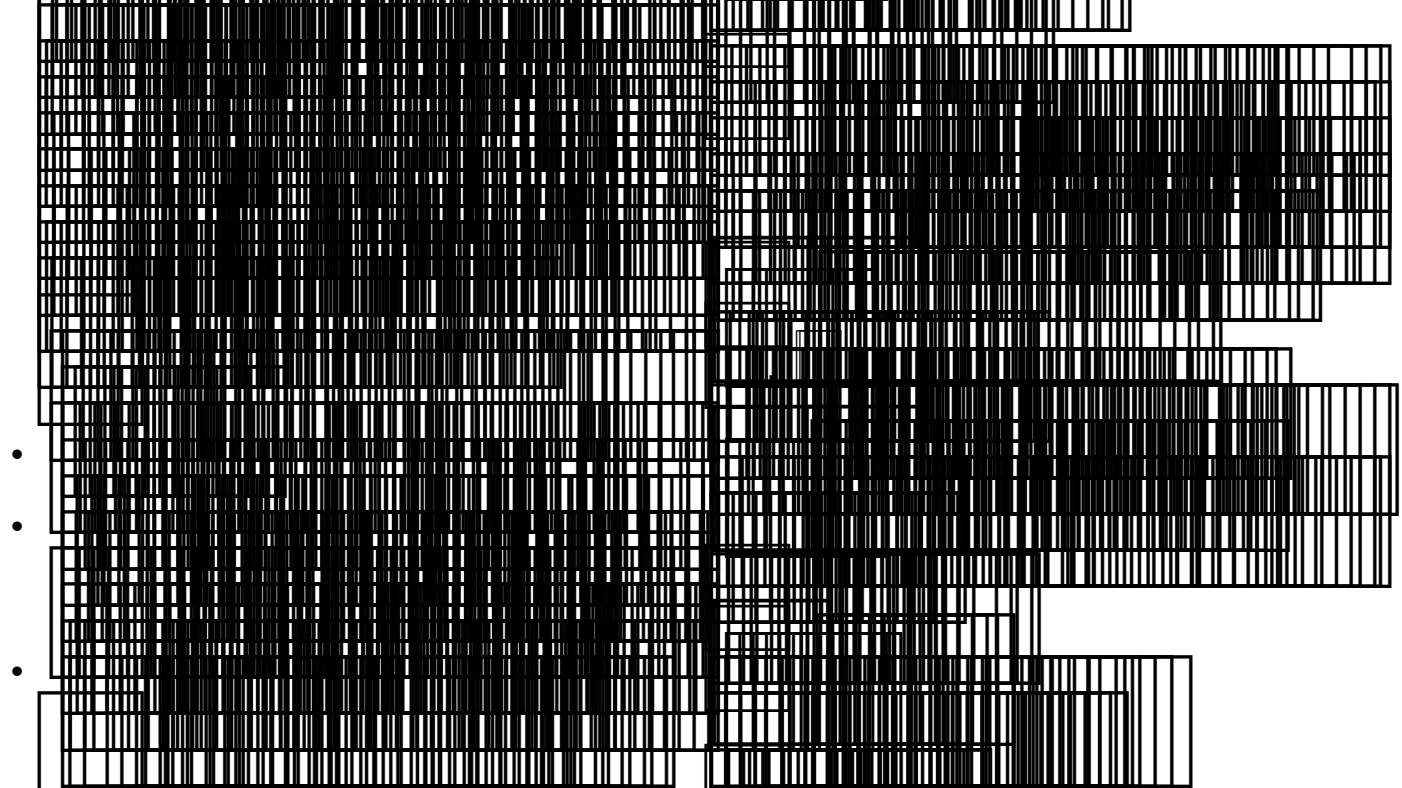
STATUS AND FAULT MESSAGES

DISPLAY MESSAGES	DESCRIPTION
STATUS MESSAGES:	

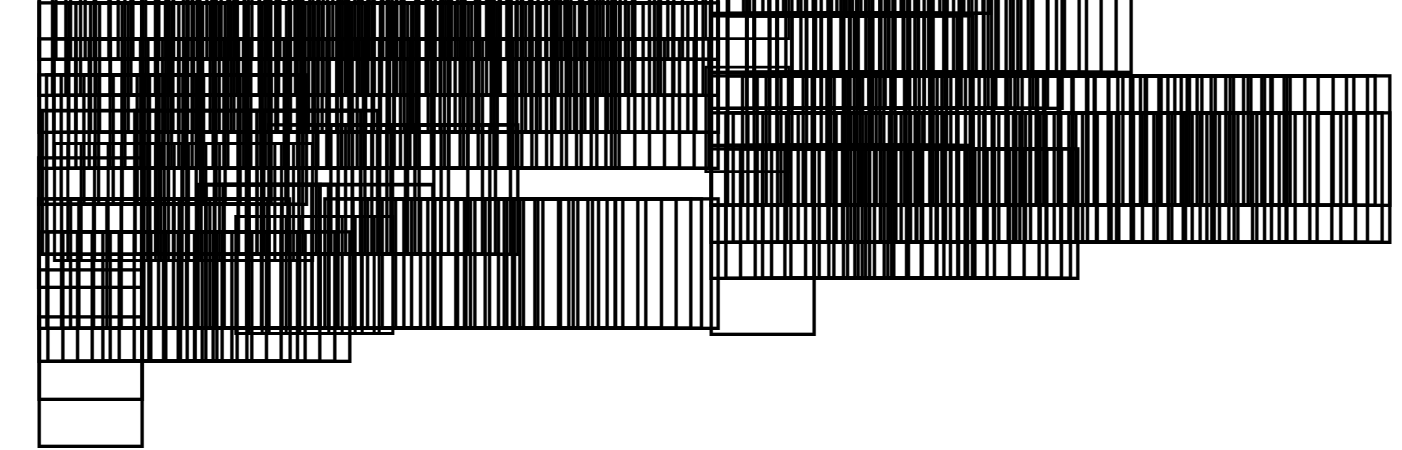
APPENDIX C

METHODS FOR DETERMINING RESET SCHEDULE AND OUTDOOR RESET RATIO CHARTS

Using the Charts to Determine Reset Schedule



Determining Reset Schedule w/ Formula



APPENDIX C

Table C-3. Header Temperature for a Building Reference Temperature of 65°F

Air Temp	RESET RATIO									
	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4
65°F										
60°F										
55°F										
50°F										
45°F										
40°F										
35°F										
30°F										
25°F										
20°F										
15°F										
10°F										
5°F										
0°F										
-5°F										
-10°F										
-15°F										
-20°F										

Table C-4. Header Temperature for a Building Reference Temperature of 70°F

Air Temp	RESET RATIO									
	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4
70°F										
65°F										
60°F										
55°F										
50°F										
45°F										
40°F										
35°F										
30°F										
25°F										
20°F										
15°F										
10°F										
5°F										
0°F										
-5°F										
-10°F										
-15°F										
-20°F										

APPENDIX C

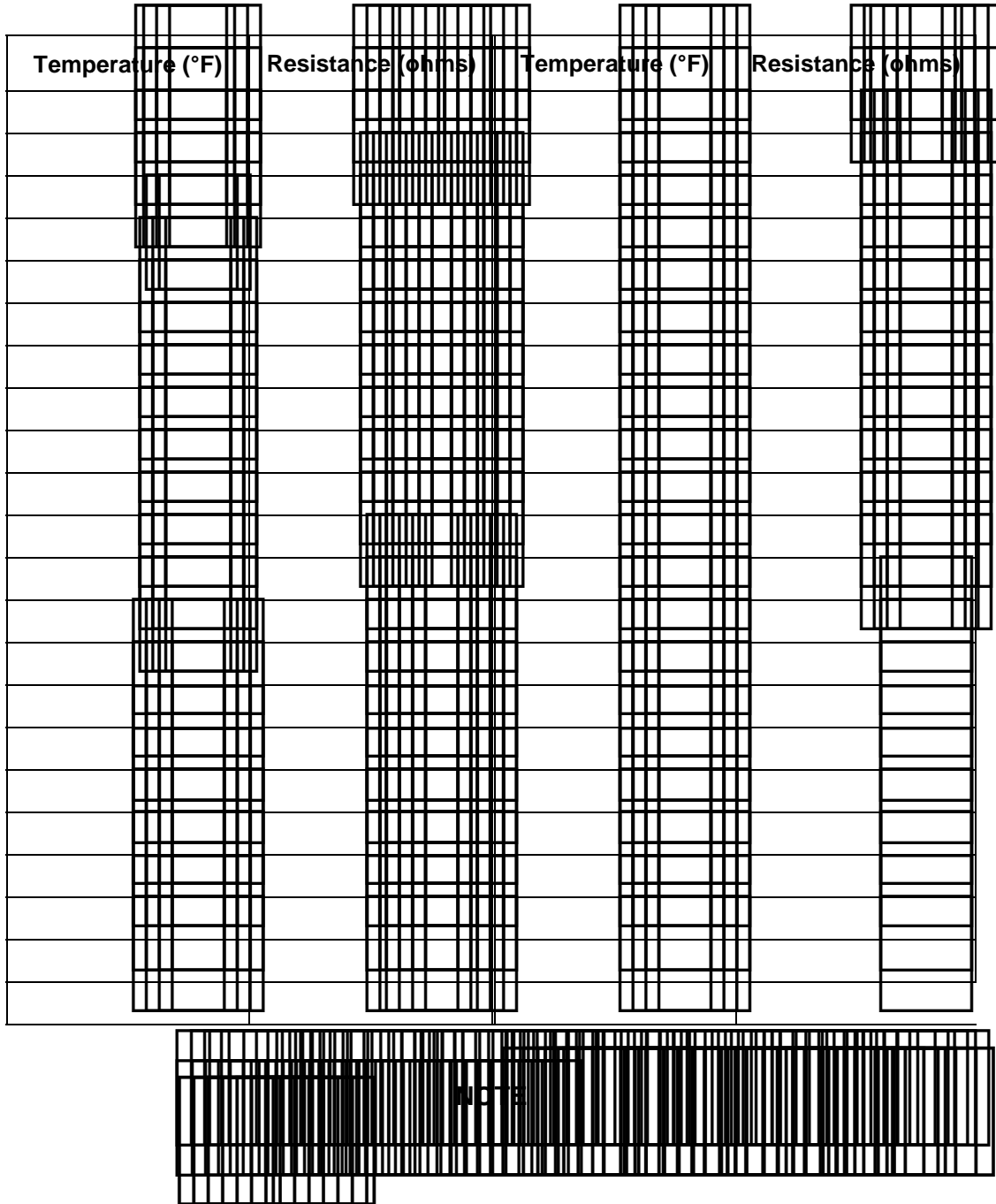
Table C-7. Header Temperature for a Building Reference Temperature of 90°F

Air Temp	RESET RATIO									
	0.6	0.8	1.0	1.2	1.5	1.8	2.0	2.2	2.4	2.6
90°F										
85°F										
80°F										
75°F										
70°F										
65°F										
60°F										
55°F										
50°F										
45°F										
40°F										
35°F										
30°F										
25°F										
20°F										
15°F										
10°F										
5°F										
0°F										



APPENDIX D

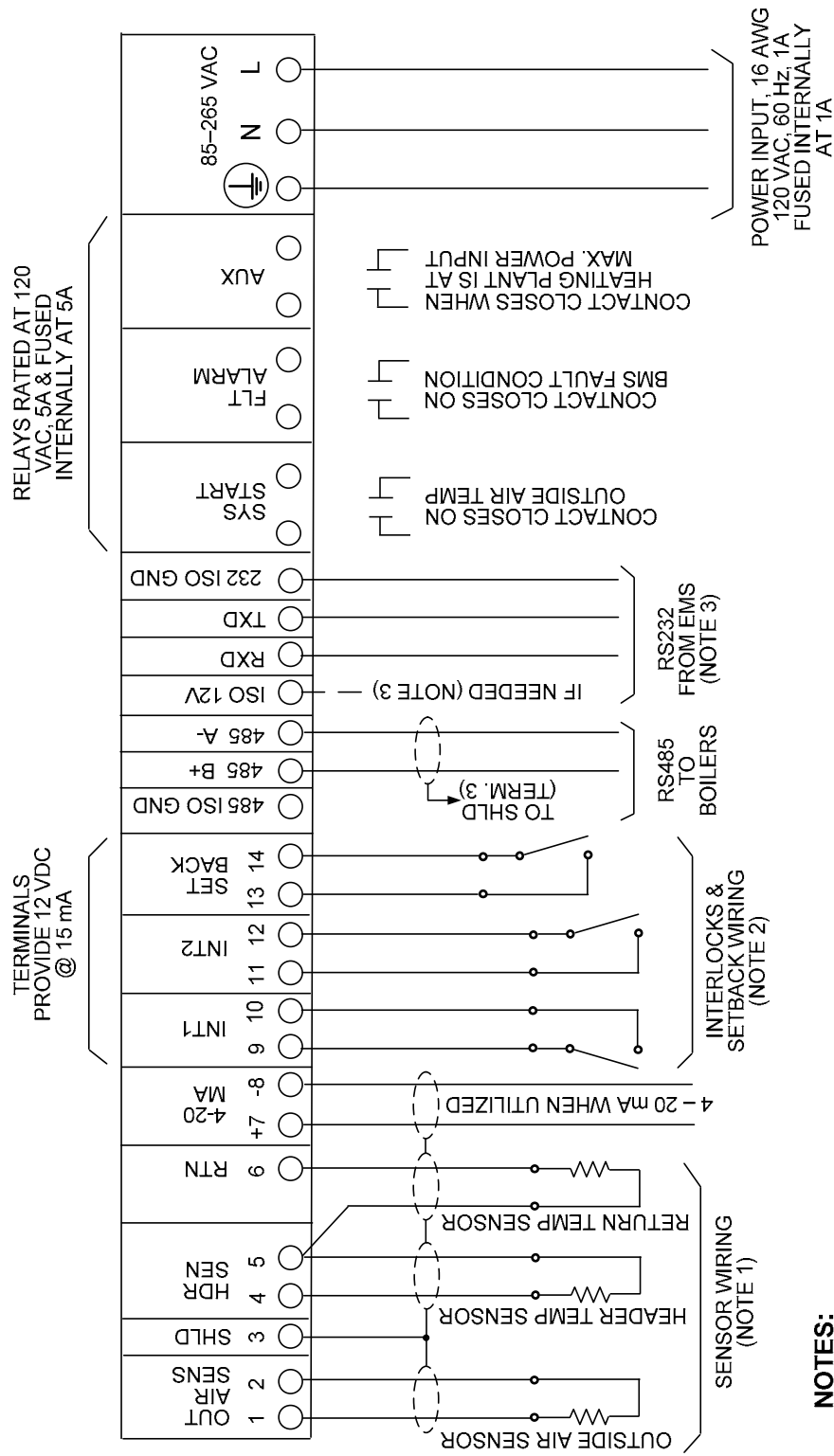
NTC Temperature Sensor Resistance Chart





APPENDIX E

BMS II WIRING DIAGRAM



NOTES:

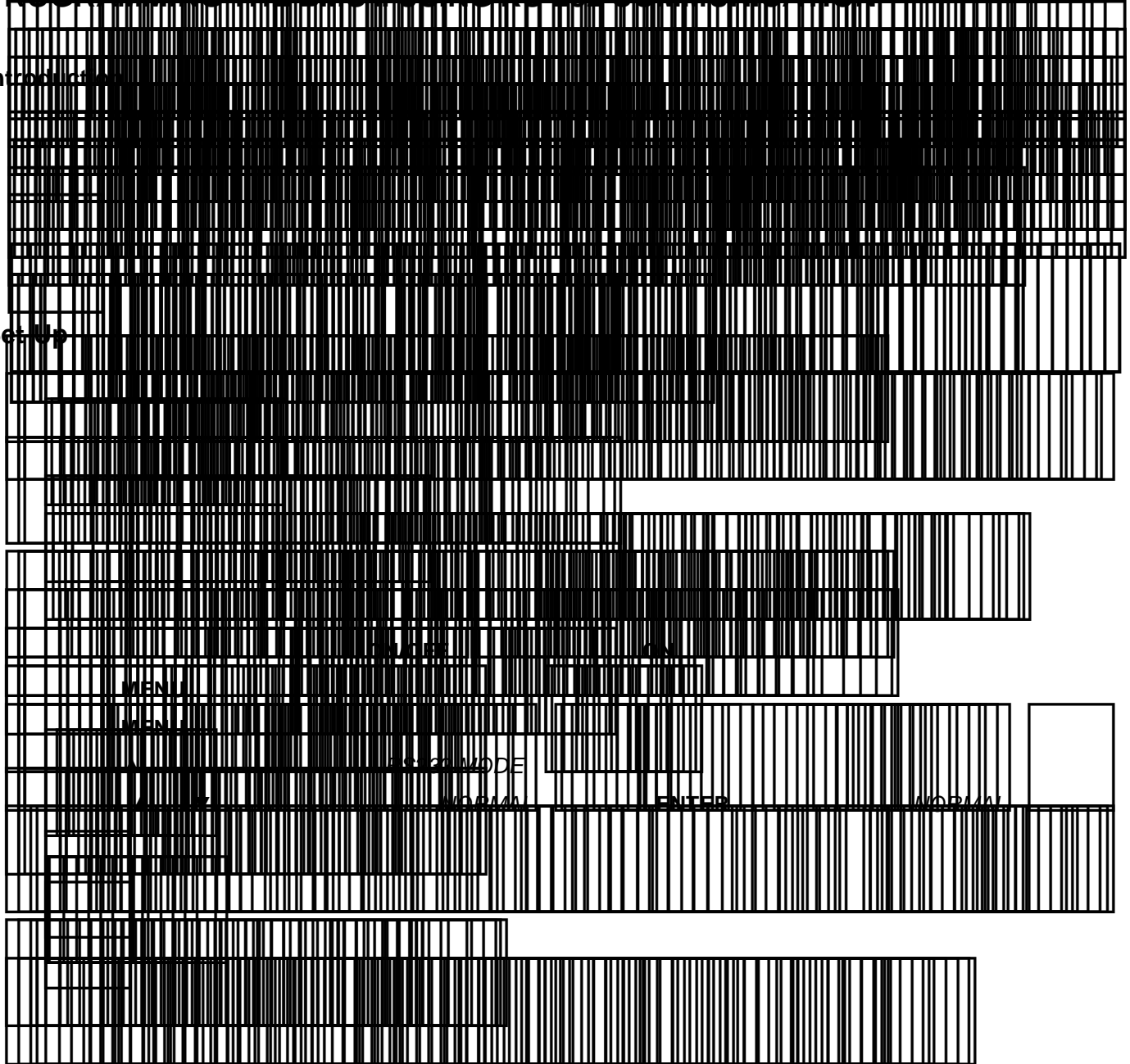
1. AERCO RECOMMENDS USING TWO-CONDUCTOR, TWISTED, SHIELDED PAIR, 22 AWG CABLE (BELDEN 9841 OR EQUIV.)
 - TERMINATE SHIELDS AT BMS SHIELD (SHLD) TERMINAL ONLY.
 - DO NOT CONNECT SHIELDS AT SENSOR ENDS.
 - DO NOT RUN SENSOR WIRING WITH POWER WIRING.
2. CONTACTS PROVIDED BY OTHERS: USE CONTACTS RATED FOR LOW SIGNAL LEVELS.
 - JUMPER INTERLOCKS (INT1, INT2) IF EXTERNAL CONTACTS ARE NOT USED.
3. IF THE EMS BEING USED CONTAINS ONLY A RS485 PORT, A RS485-TO-RS232 CONVERTER IS REQUIRED. IF NECESSARY, A 12 VDC OUTPUT IS PROVIDED BY THE BMS II TO POWER THE RS485-TO-RS232 CONVERTER.

APPENDIX G

PROGRAMMING THE BMS II USING RS-232 COMMUNICATION

Introduction

Set Up



APPENDIX H

BMS II MODBUS ADDRESS ASSIGNMENTS

H-1 BMS II STANDARD INPUT REGISTER ASSIGNMENTS

Table H-1. BMS II Standard Input Register Address Mapping

Modbus Data Address (Hex)	Menu Item	Units and Range	Default/Comments
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APPENDIX H

