

Series C-05820-A0
Boiler Alternator
Instruction Manual IM C05820.01



***SUITABLE FOR ANY 2 OR 3 BOILER APPLICATION,
OPERATING ON EITHER
STEAM PRESSURE OR HOT WATER TEMPERATURE!***



SERIES C-05820-*0 BOILER ALTERNATOR





Wiring Tips

- **Wire** with extreme caution!
- 120 V AC wiring must be 14 AWG minimum. Do not run in conduit with low voltage signal wiring!
- All wiring must conform to the **National Electrical Code** and to local code regulations. Verify all electrical ratings on equipment.
- Connecting **high** voltage to the **low** voltage circuits will damage the circuitry!

Table of Contents

1.0 Introduction

1.1 Overview of the Product.....	5
1.2 Specifications	6
1.3 Product Nomenclature	7

2.0 INSTALLATION

2.1 Mechanical	8
2.2 Wiring	8
Figure 1: C-05820 Field Wiring	8

3.0 Operation & Maintenance

3.1 Description of Operation	9
3.2 Indication	9
3.3 Modbus Communications	10
Figure 2: Dip Switches.....	10
Figure 3: Modbus Memory Addresses	10
3.4 Troubleshooting.....	11
Figure 4: “Status” or “Processor Running” LED	11

4.0 Customer Service Information

4.1 Contacts	12
4.2 Repairs	12
4.3 Service	13
4.4 Standard Terms and Conditions of Sale	14

Appendices

Figure 5: Flush-mounting Dimensions.....	16
Figure 6: Surface-mounting Dimensions.	17
Figure 7: Modbus Switch Table for C-05820 Alternator. 1 of 4.	18
Figure 8: Modbus Switch Table for C-05820 Alternator. 2 of 4.	19
Figure 9: Modbus Switch Table for C-05820 Alternator. 3 of 4.	20
Figure 10: Modbus Switch Table for C-05820 Alternator. 4 of 4.	21
Figure 11: PC Board Components	22
Index	23

1.0 INTRODUCTION

1.1 Overview of the Product

The **Hays Cleveland Model C-05820-*0 BOILER LEAD ALTERNATOR** is a basic boiler sequencer suitable for any two- or three-boiler installation, operating on either steam pressure or hot water temperature. Modbus communication for interfacing with SCADA or other controls is standard. The unit provides mode selection including “auto” and “clock” as well as “lead” boiler selection. Boiler status lights on the front face light to show which boilers are in use.

The **Model C-05820-*0** provides alternator-type sequencing logic to automatically fire the boilers as required to meet changing load conditions. The boilers continue to operate from their own modulation controls. Remote pressure or temperature switches for each boiler provide an input signal for the lead lag control.

1.2 Specifications

Power Requirements: 120 v AC \pm 10, 50/60 Hz., 10 va.

Indicator Lights: Neon lamps for Boilers #1, #2 and #3*.

Function Switch (Lead Boiler Select):

- Three Boilers (5 Modes): Auto, Boiler #1, Boiler #2, Boiler #3, and Clock.
- Two Boilers (4 Modes): Auto, Boiler #1, Boiler #2, and Clock.

Manual/Auto Switch (Optional):

- Two-position rocker switch, one per boiler.

Electrical Connections: 23-pole terminal block.

Relay Contact Rating: 10 amp, non-inductive to 120 v AC, 50/60 Hz.

Fuse: one, @ 1 amp.

Mounting: Flush (panel) or surface (wall) mountable housings available.

Construction: Durable plastic construction (panel) or rugged steel box (surface-mounted).

Ambient Temperature Limits for Housing: 32 to 130F (0 to 54C).

Relative Humidity: 0-90%, non-condensing.

Shipping Weight: 3 lbs. (approx).

Approvals: NYC DEP approved. UL and CUL pending.

Specifications are subject to change without notice.

C - 0 5 8 2 0 - *0 - A - B - C - D - E***Current Model Designation.**

1.3 Product Nomenclature

The basic catalog number for the **Hays Cleveland Model C-05820-*0 BOILER ALTERNATOR** is shown below. Replace suffixes **A** through **E** with the desired selections from the table below.

A Number of Boilers.

2 = Two.

3 = Three.

B Application.

1 = Steam pressure.

2 = Hot water temperature.

C Enclosure.

1 = Surface-mounting unit.

2 = Panel-mounting unit.

D Manual/Auto Switches.

1 = Switches included: internal (standard).

2 = No switches. Meets NYC DEP requirements.

E Function Switch (4-mode or 5-mode) Location:

1 = Switch inside unit (standard).

2 = Switch on front of unit (option).

2.0 INSTALLATION

2.1 Mechanical

For mounting dimensions, refer to Figures 5 (for panel) and 6 (for wall). Mount the alternator with other controls and instruments in a panel or cabinet, or on a wall, where temperatures are within the housing limits as shown in the specifications (32 - 130F or 0 - 54C). Preferably, the face of the controller should be visible from a position in front of the boiler.

2.2 Wiring

Refer to Figure 1. Power, inputs, outputs and Modbus terminals are located on the back of the unit.

- 120 vAC is applied to terminals H (hot) and N (neutral). Terminal G is ground.
- Terminals 1 and 2 are Lead Boiler switch inputs.
- Terminals 3 and 4 are Lag Boiler 1 switch inputs.
- Terminals 5 and 6 are Lag Boiler 2 switch inputs.
- Terminals 7 and 8 are the external clock contact input.
- Terminals 9 (+), 10 (-) and 11 (SHD) provide for the Modbus communication.
- Terminals 12 (N), 13 (limits out) and 14 (limits in) are the limit circuit Boiler 1.
- Terminals 15 (N), 16 (limits out) and 17 (limits in) are the limit circuit Boiler 2.
- Terminals 18 (N), 19 (limits out) and 20 (limits in) are the limit circuit Boiler 3.

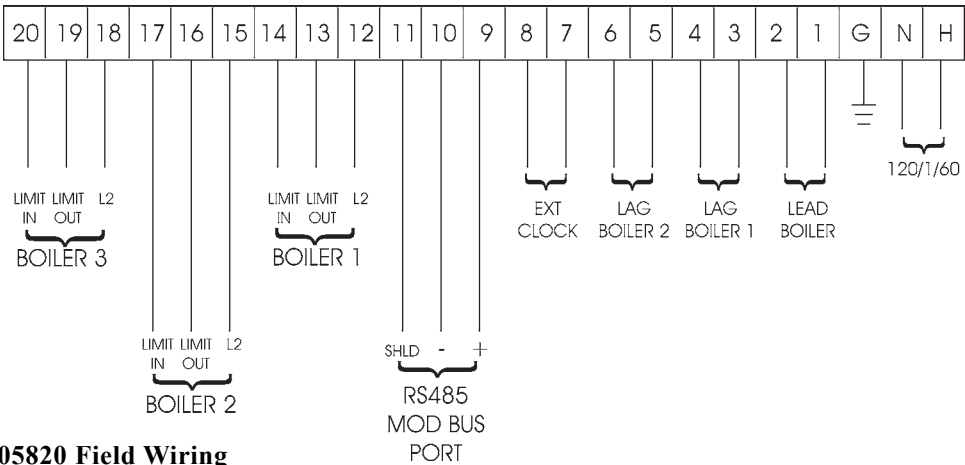


Figure 1: C-05820 Field Wiring

3.0 OPERATION & MAINTENANCE



Warning! Only qualified technicians should operate, adjust, or maintain this equipment. 120 V is present in enclosure interior on electrical terminal points.

3.1 Description of Operation

The operator can choose from the following sequencing options, using the function jumper on the printed circuit board or the optional function switch mounted on the front of the unit:

- 1) Selector position **AUTO**: The lead boiler is changed automatically after every firing cycle.
- 2) Selector position **#1, #2 or #3**: The selected lead boiler is fixed until the operator changes the setting.
- 3) Selector position **CLOCK**: An external 7-day timer can be used to change the lead boiler at times programmed by the operator. The changeover will not interrupt the boilers during the firing cycle, but will occur at the first opportunity after all boilers are offline. Recommended clocks include the **PARAGON® 7007-00**, **INTERMATIC® V4640**, and **TORK® W 220**.

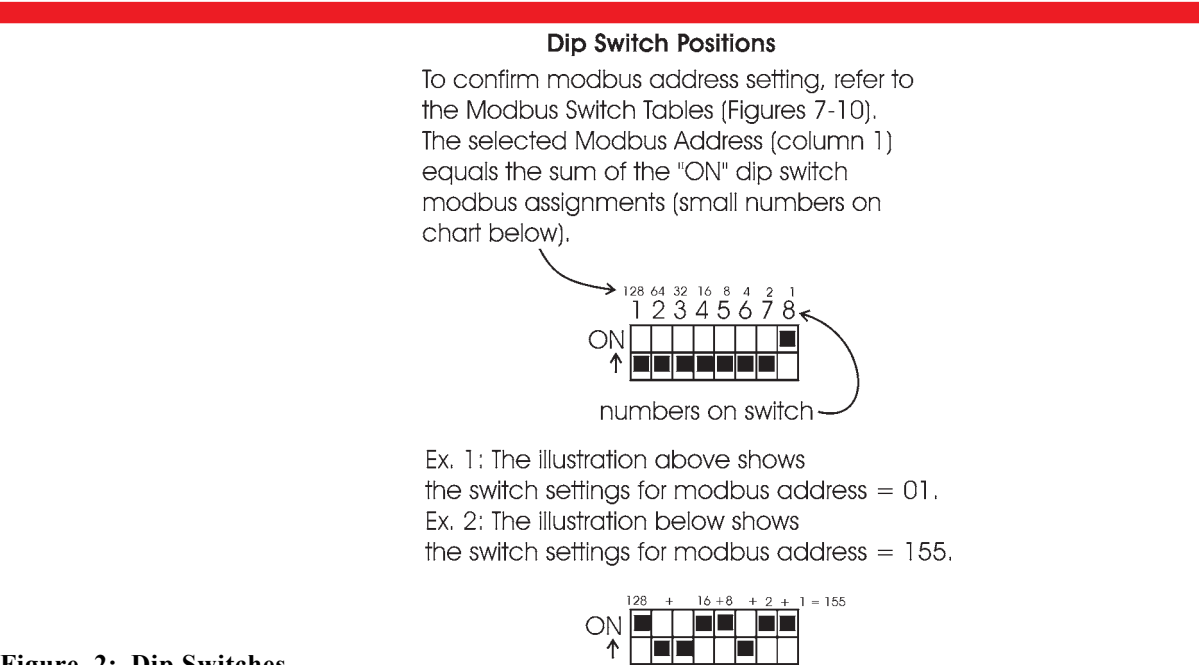
The **Hays Cleveland Model C-05820-*0 BOILER ALTERNATOR** can be equipped with an optional Auto/Manual switch for each boiler. The manual position permits the operator to bypass the lead lag control and use local boiler limits to turn the boilers on and off. With the switches in the automatic position, the boilers are under the control of the alternator functions. (**Note:** NYC DEP units are not equipped with Auto/Manual switches.)

3.2 Indication

Boiler status lights for each boiler are located on the front of the alternator housing. They light to indicate that a boiler limit has been energized.

3.3 Modbus Communications

The RS485 uses the Modbus – RTU Protocol. The communications port is set at 9600 or 19,200 baud (jumper selection), 1 start, 8 data, 1 stop, and no parity. Cable for communications must be Belden 9841 or equal. The Modbus address may be set from 1 - 247 by using the dip switches as shown on Figure 2.



3.4 Troubleshooting

A red diagnostic LED is provided. This is the “STATUS” LED located on the printed circuit board. It indicates the state of the microprocessor (i.e., that it is running or not) by blinking at different rates as shown in Figure 3.

ON/OFF TIMING	STATUS/FAULT
1 SECOND	MICROPROCESSOR IS FUNCTIONING PROPERLY.
0.05 SECOND	WATCH DOG TIMER RESET: AN ERROR HAS OCCURRED IN THE MICROPROCESSOR.*

*Turning the power off and then back on may clear up this fault. If it does not, contact Hays Cleveland.

Figure 4: “Status” or “Processor Running” LED

4.0 CUSTOMER SERVICE INFORMATION

4.1 Contacts

Hays Cleveland Sales Office

1903 South Congress Avenue

Boynton Beach FL 33426

Telephone: 561.734.9400

Fax: 561.734.8060

email: salescombustion@unicontrolinc.com

Hays Cleveland Customer Service Department

1111 Brookpark Road

Cleveland OH 44109

Telephone: 216.398.4414

Fax: 216.398.8556

email: customerservice@unicontrolinc.com

Visit us on the WEB!

<http://www.hayscleveland.com>

4.2 Repairs

Damaged or defective units may be returned to the factory for repair. However, factory authorization must be obtained before shipping whether warranty or non-warranty service is required, and all units must be shipped prepaid.

A letter of transmittal that includes the following information should accompany the returned instrument:

1. Location, type of service, and length of time in service of the unit.
2. Description of the faulty operation of the device and the circumstances of the failure.

3. Name and telephone number of the person to contact if there are questions about the unit.
4. Indicate whether warranty or non-warranty service is requested.
5. Attach Purchase Order for all out-of-warranty repairs.
6. Complete shipping instructions for the return of the repaired instrument.
7. Original purchase order number and date of purchase.
8. Return Goods Authorization number provided by the factory when you called.

Clearly label the shipping container:

RETURN FOR REPAIR

Model _____

RG # _____

Ship prepaid to:

HAYS CLEVELAND

1111 Brookpark Road

Cleveland OH 44109-5869

216-398-4414



Please follow this procedure. It expedites handling of the returned item, and avoids unnecessary additional charges for inspection and testing to determine the problem before repairing it.

4.3 Service

A **Maintenance and Service Contract** can ensure trouble-free, economical operation of **Hays Cleveland** equipment for many years. One-time on-site service by a factory-trained service engineer can also be provided as needed. Contact Hays Cleveland for information on these service options.

4.4 Standard Terms and Conditions of Sale

TERMS OF SALE: 1% discount if paid in ten (10) days, net amount due and payable in thirty (30) days.

AGREEMENT OF SALE: Acceptance by Seller of any order placed for goods whether submitted on Buyer's purchase order form or on seller's Sales Order Acknowledgment form, shall be subject to Seller's Standard Terms and Conditions of Sale and is conditioned upon the Buyer's acceptance of these Standard Terms and Conditions.

TERMS OF CONTRACT: Any terms or conditions of the buyer's order which are inconsistent with these terms and conditions shall not be binding on the Seller and shall not be considered applicable to the sale or shipment of goods or materials. Unless buyer shall notify Seller in writing to the contrary within ten (10) days after the mailing of the Sales Contract by Seller, acceptance of the terms and conditions hereof by Buyer shall be indicated and, in the absence of such notification, the sale and shipment by Seller of the goods and materials covered hereby shall be conclusively deemed to be subject to the terms and conditions hereof.

PRICES: All prices and specifications and applicable discounts are subject to change without notice. Sales contracts which call for delivery in the future will be billed at prices in effect at the time of shipment. Shipping weights shown are approximate and subject to change without notice.

SHIPMENT AND PAYMENTS: All prices contained on the Sales Contract are F.O.B. factory in Cleveland, Ohio. No freight is allowed on any shipments. Shipments and deliveries shall at all times be subject to the approval of Seller's Credit Department, and at any time seller may require payment in advance or satisfactory security or guarantee that invoices will be promptly paid when due. If buyer fails to comply with any terms of payment, seller, in addition to its other rights and remedies, but not in limitation thereof, reserves the right to withhold further deliveries or terminate the Agreement, and any unpaid amount thereon shall become due immediately. Terms of payment shall be as set forth on the Sales Contract.

DELAYS AND DEFAULTS: Delays or defaults in delivery by Seller of the goods and materials covered by the Sales Contract shall be excused so far as the same is caused by fire, strikes, accident, governmental regulation, or any delays unavoidable or beyond reasonable control of Seller. In no event shall Seller be liable for any consequential, special, or contingent damages on account of any default or delay in delivery.

NONCANCELLATION: Orders are not subject to suspension, reduction, or cancellation, except on terms that will indemnify Seller against loss.

SPECIFICATIONS: Seller relies on specifications and other data furnished by the Buyer, an architect, contractor, or consulting engineer in all phases of the work covered by the Sales Contract. Seller shall be responsible to check quantities only. Alterations to or changes in specifications, approval of samples, changes in delivery instructions and all other instructions must be submitted in writing to Seller.

In the event Seller performs design or engineering work at the request of Buyer, an architect, contractor, consulting engineer, or representative in any phase of the work covered by the Sales Contract, Seller shall not be responsible for any damages claimed by Buyer as a result of alleged errors or defects in such design or engineering work.

WARRANTY AND LIMITATION OF LIABILITY: Seller warrants that the goods supplied by it have been manufactured in accordance with its standard manufacturing practices and conform to the contract or catalog description set forth in the order. Seller further warrants that the goods supplied by it are fit for the ordinary purpose or purposes specified in its catalog for which such goods are used when installed in accordance with Seller's recommended installation procedures. Except as stated herein, Seller makes no express warranty with respect to goods supplied by it and Seller makes no warranty that the goods are fit for any particular purpose.

When the use of materials not manufactured by Seller is suggested by Seller's recommended installation procedures or otherwise, Seller makes no express warranty with respect to such materials nor that such materials are merchantable or fit for any particular purpose.

Seller will, at its sole option, credit, repair or replace, any goods supplied by it which its examination shall disclose to its satisfaction are defective in workmanship or material and are returned to it within one year from the date of shipment and any claim not made within this period shall conclusively be deemed waived by Buyer. Credit, repair or replacement will be preconditioned upon examination of the goods by Seller, and, if requested by Seller, return of the goods to Seller at its direction and expense. No goods are to be returned to Seller without its written consent. Seller shall not be liable for any expense incurred by Buyer in order to remedy any defect in its goods. Seller shall not be liable for any consequential, special, or contingent damage or expense, arising directly or indirectly from any defect in its goods or from the use of any defective goods. The remedies set forth herein shall constitute the exclusive remedies available to Buyer and are in lieu of all other remedies.

CLAIMS: Claims for shortage of goods or for mistakes or errors in billing must be presented within forty-five (45) days from the date of shipment of goods and must state the packing slip number and container number applicable to the claim. Any claim not so presented will be conclusively deemed waived.

TAXES: Any federal taxes or other government charges on the sale, shipment, or installation of the goods or equipment covered by the Sales Contract shall be added to the price and paid by Buyer, or, in lieu thereof, the Buyer shall furnish the Seller with tax-exemption certificates acceptable to the taxing authority. The procedure also applies to duty and other similar charges on export sales. Seller is not responsible for sales and/or use tax in any state other than Ohio. The purchase made under this Sales Contract must be exempt or paid directly by Buyer. If Seller is required to pay any such tax, there shall be added to the prices quoted herein all such state and local taxes. Buyer agrees to reimburse and save Seller harmless from all such state and local taxes, including interest and penalties thereon, which may at any time be payable to any state or local government unit with respect to the sale of any goods or materials covered by the Sales Contract.

CORRECTIONS: Typographical or clerical errors contained in the Sales Contract, including prices, are subject to correction by the Seller.

FAIR LABOR STANDARDS: All goods covered by the Sales Contract have been produced in conformity with all applicable provisions of the Fair Labor Standards Act of 1938 as amended.

RENEGOTIATION: Unless advised by Buyer in writing, Seller assumes that Buyer's order and the Sales Contract are not renegotiable under the Renegotiation Act of 1951.

APPLICABLE LAW: All questions arising out of the Sales Contract, which shall be deemed an Ohio contract, shall be governed by the laws of the state of Ohio.

EXCLUSIVE TERMS: The Sales Contract shall constitute the complete contract between the parties, and no one has authority to depart from the terms and conditions set forth therein, nor to make any representations or arrangements other than those printed thereon whether in the execution or in the performance of the Sales Contract, unless the same are written on the face of the Sales Contract or are given in writing with it or in pursuance of it, and are fully approved in writing by an officer or authorized employee of the Seller.

LIMITATION FOR SUITS: Any controversy or claim arising out of or relating to this Sales Contract or the breach thereof, must be commenced within one (1) year after the cause of action accrued.

APPENDICES

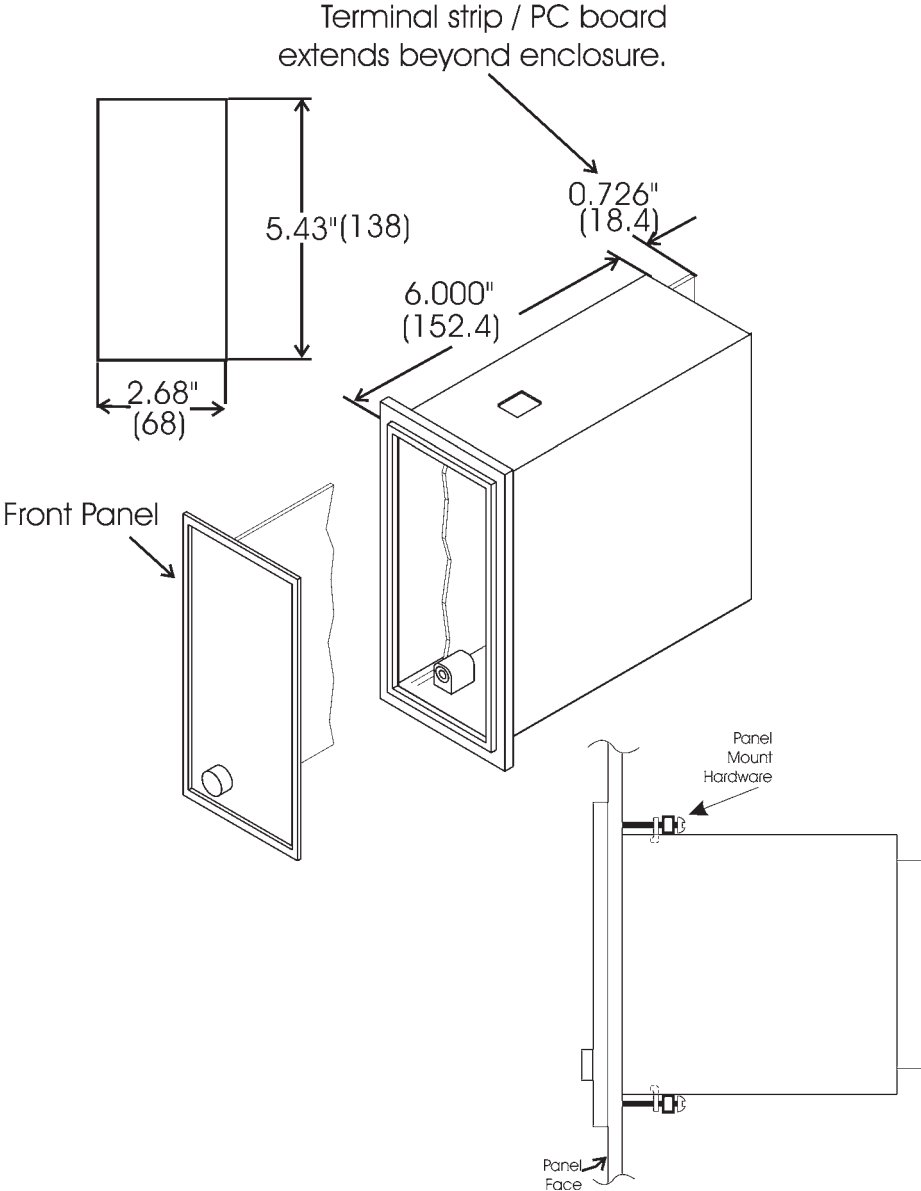


Figure 5: Flush-mounting Dimensions.
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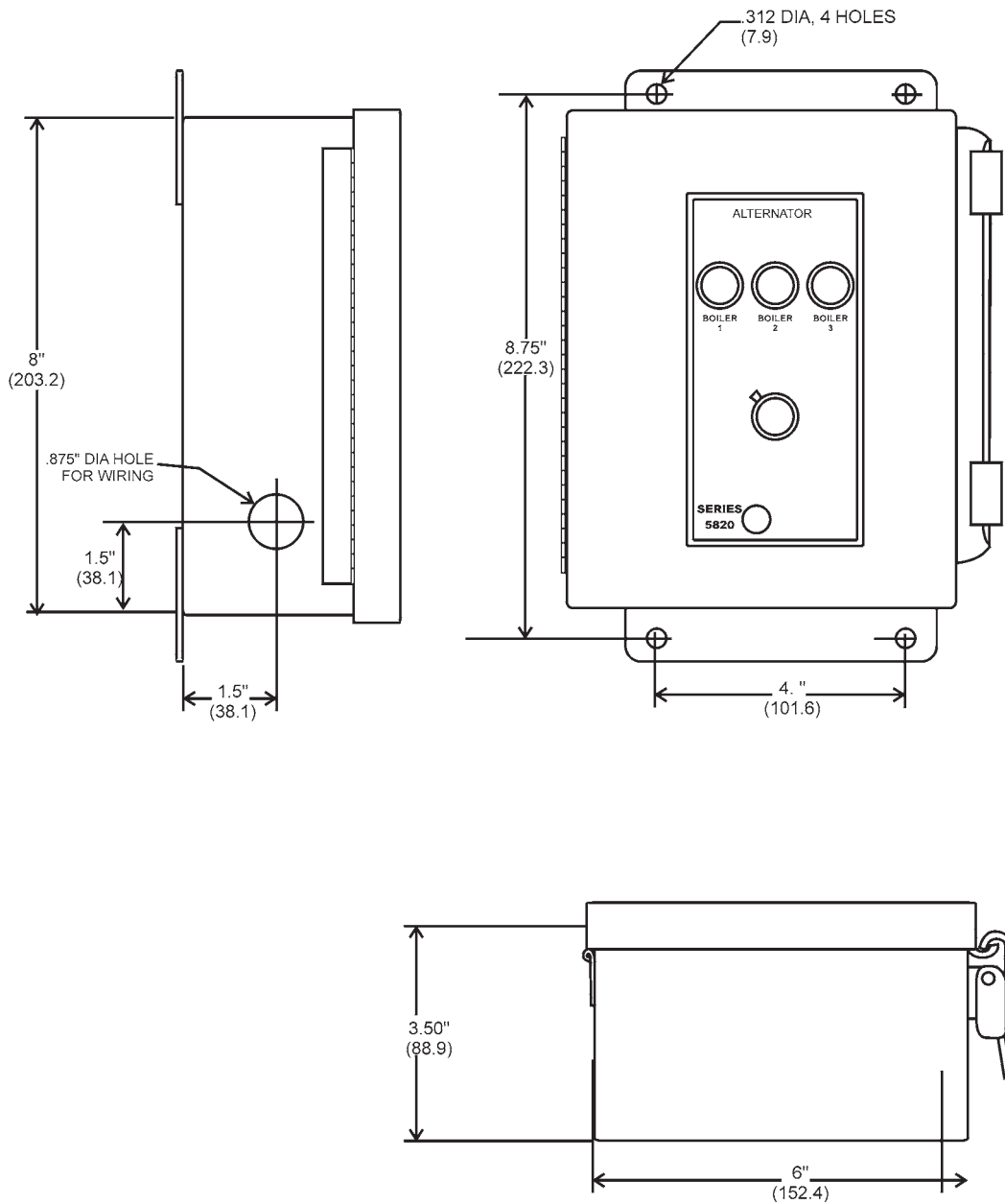


Figure 6: Surface-mounting Dimensions.

ModBus Address	Switch #1	Switch #2	Switch #3	Switch #4	Switch #5	Switch #6	Switch #7	Switch #8
01	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
02	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
03	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
04	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
05	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
06	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF
07	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
08	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
09	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON
10	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
11	OFF	OFF	OFF	OFF	ON	OFF	ON	ON
12	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
13	OFF	OFF	OFF	OFF	ON	ON	OFF	ON
14	OFF	OFF	OFF	OFF	ON	ON	ON	OFF
15	OFF	OFF	OFF	OFF	ON	ON	ON	ON
16	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
17	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
18	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF
19	OFF	OFF	OFF	ON	OFF	OFF	ON	ON
20	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
21	OFF	OFF	OFF	ON	OFF	ON	OFF	ON
22	OFF	OFF	OFF	ON	OFF	ON	ON	OFF
23	OFF	OFF	OFF	ON	OFF	ON	ON	ON
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
25	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
26	OFF	OFF	OFF	ON	ON	OFF	ON	OFF
27	OFF	OFF	OFF	ON	ON	OFF	ON	ON
28	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
29	OFF	OFF	OFF	ON	ON	ON	OFF	ON
30	OFF	OFF	OFF	ON	ON	ON	ON	OFF
31	OFF	OFF	OFF	ON	ON	ON	ON	ON
32	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
33	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
34	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
35	OFF	OFF	ON	OFF	OFF	OFF	ON	ON
36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
37	OFF	OFF	ON	OFF	OFF	ON	OFF	ON
38	OFF	OFF	ON	OFF	OFF	ON	ON	OFF
39	OFF	OFF	ON	OFF	OFF	ON	ON	ON
40	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
41	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
42	OFF	OFF	ON	OFF	ON	OFF	ON	OFF
43	OFF	OFF	ON	OFF	ON	OFF	ON	ON
44	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
45	OFF	OFF	ON	OFF	ON	ON	OFF	ON
46	OFF	OFF	ON	OFF	ON	ON	ON	OFF
47	OFF	OFF	ON	OFF	ON	ON	ON	ON
48	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
49	OFF	OFF	ON	ON	OFF	OFF	OFF	ON
50	OFF	OFF	ON	ON	OFF	OFF	ON	OFF
51	OFF	OFF	ON	ON	OFF	OFF	ON	ON
52	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
53	OFF	OFF	ON	ON	OFF	ON	OFF	ON
54	OFF	OFF	ON	ON	OFF	ON	ON	OFF
55	OFF	OFF	ON	ON	OFF	ON	ON	ON
56	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
57	OFF	OFF	ON	ON	ON	OFF	OFF	ON
58	OFF	OFF	ON	ON	ON	OFF	ON	OFF
59	OFF	OFF	ON	ON	ON	OFF	ON	ON
60	OFF	OFF	ON	ON	ON	ON	OFF	OFF
61	OFF	OFF	ON	ON	ON	ON	OFF	ON
62	OFF	OFF	ON	ON	ON	ON	ON	OFF
63	OFF	OFF	ON	ON	ON	ON	ON	ON
64	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF

Figure 7: Modbus Switch Table for C-05820 Alternator. 1 of 4.

ModBus Address	Switch #1	Switch #2	Switch #3	Switch #4	Switch #5	Switch #6	Switch #7	Switch #8
65	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON
66	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
67	OFF	ON	OFF	OFF	OFF	OFF	ON	ON
68	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
69	OFF	ON	OFF	OFF	OFF	ON	OFF	ON
70	OFF	ON	OFF	OFF	OFF	ON	ON	OFF
71	OFF	ON	OFF	OFF	OFF	ON	ON	ON
72	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
73	OFF	ON	OFF	OFF	ON	OFF	OFF	ON
74	OFF	ON	OFF	OFF	ON	OFF	ON	OFF
75	OFF	ON	OFF	OFF	ON	OFF	ON	ON
76	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
77	OFF	ON	OFF	OFF	ON	ON	OFF	ON
78	OFF	ON	OFF	OFF	ON	ON	ON	OFF
79	OFF	ON	OFF	OFF	ON	ON	ON	ON
80	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
81	OFF	ON	OFF	ON	OFF	OFF	OFF	ON
82	OFF	ON	OFF	ON	OFF	OFF	ON	OFF
83	OFF	ON	OFF	ON	OFF	OFF	ON	ON
84	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
85	OFF	ON	OFF	ON	OFF	ON	OFF	ON
86	OFF	ON	OFF	ON	OFF	ON	ON	OFF
87	OFF	ON	OFF	ON	OFF	ON	ON	ON
88	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
89	OFF	ON	OFF	ON	ON	OFF	OFF	ON
90	OFF	ON	OFF	ON	ON	OFF	ON	OFF
91	OFF	ON	OFF	ON	ON	OFF	ON	ON
92	OFF	ON	OFF	ON	ON	ON	OFF	OFF
93	OFF	ON	OFF	ON	ON	ON	OFF	ON
94	OFF	ON	OFF	ON	ON	ON	ON	OFF
95	OFF	ON	OFF	ON	ON	ON	ON	ON
96	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
97	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
98	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
99	OFF	ON	ON	OFF	OFF	OFF	ON	ON
100	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
101	OFF	ON	ON	OFF	OFF	ON	OFF	ON
102	OFF	ON	ON	OFF	OFF	ON	ON	OFF
103	OFF	ON	ON	OFF	OFF	ON	ON	ON
104	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
105	OFF	ON	ON	OFF	ON	OFF	OFF	ON
106	OFF	ON	ON	OFF	ON	OFF	ON	OFF
107	OFF	ON	ON	OFF	ON	OFF	ON	ON
108	OFF	ON	ON	OFF	ON	ON	OFF	OFF
109	OFF	ON	ON	OFF	ON	ON	OFF	ON
110	OFF	ON	ON	OFF	ON	ON	ON	OFF
111	OFF	ON	ON	OFF	ON	ON	ON	ON
112	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
113	OFF	ON	ON	ON	OFF	OFF	OFF	ON
114	OFF	ON	ON	ON	OFF	OFF	ON	OFF
115	OFF	ON	ON	ON	OFF	OFF	ON	ON
116	OFF	ON	ON	ON	OFF	ON	OFF	OFF
117	OFF	ON	ON	ON	OFF	ON	OFF	ON
118	OFF	ON	ON	ON	OFF	ON	ON	OFF
119	OFF	ON	ON	ON	OFF	ON	ON	ON
120	OFF	ON	ON	ON	ON	OFF	OFF	OFF
121	OFF	ON	ON	ON	ON	OFF	OFF	ON
122	OFF	ON	ON	ON	ON	OFF	ON	OFF
123	OFF	ON	ON	ON	ON	OFF	ON	ON
124	OFF	ON	ON	ON	ON	ON	OFF	OFF
125	OFF	ON	ON	ON	ON	ON	OFF	ON
126	OFF	ON	ON	ON	ON	ON	ON	OFF
127	OFF	ON	ON	ON	ON	ON	ON	ON
128	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
129	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON

Figure 8: Modbus Switch Table for C-05820 Alternator. 2 of 4.

ModBus Address	Switch #1	Switch #2	Switch #3	Switch #4	Switch #5	Switch #6	Switch #7	Switch #8
130	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
131	ON	OFF	OFF	OFF	OFF	OFF	ON	ON
132	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
133	ON	OFF	OFF	OFF	OFF	ON	OFF	ON
134	ON	OFF	OFF	OFF	OFF	ON	ON	OFF
135	ON	OFF	OFF	OFF	OFF	ON	ON	ON
136	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
137	ON	OFF	OFF	OFF	ON	OFF	OFF	ON
138	ON	OFF	OFF	OFF	ON	OFF	ON	OFF
139	ON	OFF	OFF	OFF	ON	OFF	ON	ON
140	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
141	ON	OFF	OFF	OFF	ON	ON	OFF	ON
142	ON	OFF	OFF	OFF	ON	ON	ON	OFF
143	ON	OFF	OFF	OFF	ON	ON	ON	ON
144	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
145	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
146	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
147	ON	OFF	OFF	ON	OFF	OFF	ON	ON
148	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
149	ON	OFF	OFF	ON	OFF	ON	OFF	ON
150	ON	OFF	OFF	ON	OFF	ON	ON	OFF
151	ON	OFF	OFF	ON	OFF	ON	ON	ON
152	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
153	ON	OFF	OFF	ON	ON	OFF	OFF	ON
154	ON	OFF	OFF	ON	ON	OFF	ON	OFF
155	ON	OFF	OFF	ON	ON	OFF	ON	ON
156	ON	OFF	OFF	ON	ON	ON	OFF	OFF
157	ON	OFF	OFF	ON	ON	ON	OFF	ON
158	ON	OFF	OFF	ON	ON	ON	ON	OFF
159	ON	OFF	OFF	ON	ON	ON	ON	ON
160	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
161	ON	OFF	ON	OFF	OFF	OFF	OFF	ON
162	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
163	ON	OFF	ON	OFF	OFF	OFF	ON	ON
164	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
165	ON	OFF	ON	OFF	OFF	ON	OFF	ON
166	ON	OFF	ON	OFF	OFF	ON	ON	OFF
167	ON	OFF	ON	OFF	OFF	ON	ON	ON
168	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
169	ON	OFF	ON	OFF	ON	OFF	OFF	ON
170	ON	OFF	ON	OFF	ON	OFF	ON	OFF
171	ON	OFF	ON	OFF	ON	OFF	ON	ON
172	ON	OFF	ON	OFF	ON	ON	OFF	OFF
173	ON	OFF	ON	OFF	ON	ON	OFF	ON
174	ON	OFF	ON	OFF	ON	ON	ON	OFF
175	ON	OFF	ON	OFF	ON	ON	ON	ON
176	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
177	ON	OFF	ON	ON	OFF	OFF	OFF	ON
178	ON	OFF	ON	ON	OFF	OFF	ON	OFF
179	ON	OFF	ON	ON	OFF	OFF	ON	ON
180	ON	OFF	ON	ON	OFF	ON	OFF	OFF
181	ON	OFF	ON	ON	OFF	ON	OFF	ON
182	ON	OFF	ON	ON	OFF	ON	ON	OFF
183	ON	OFF	ON	ON	OFF	ON	ON	ON
184	ON	OFF	ON	ON	ON	OFF	OFF	OFF
185	ON	OFF	ON	ON	ON	OFF	OFF	ON
186	ON	OFF	ON	ON	ON	OFF	ON	OFF
187	ON	OFF	ON	ON	ON	OFF	ON	ON
188	ON	OFF	ON	ON	ON	ON	OFF	OFF
189	ON	OFF	ON	ON	ON	ON	OFF	ON
190	ON	OFF	ON	ON	ON	ON	ON	OFF
191	ON	OFF	ON	ON	ON	ON	ON	ON
192	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
193	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
194	ON	ON	OFF	OFF	OFF	OFF	ON	OFF

Figure 9: Modbus Switch Table for C-05820 Alternator. 3 of 4.

ModBus Address	Switch #1	Switch #2	Switch #3	Switch #4	Switch #5	Switch #6	Switch #7	Switch #8
195	ON	ON	OFF	OFF	OFF	OFF	ON	ON
196	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
197	ON	ON	OFF	OFF	OFF	ON	OFF	ON
198	ON	ON	OFF	OFF	OFF	ON	ON	OFF
199	ON	ON	OFF	OFF	OFF	ON	ON	ON
200	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
201	ON	ON	OFF	OFF	ON	OFF	OFF	ON
202	ON	ON	OFF	OFF	ON	OFF	ON	OFF
203	ON	ON	OFF	OFF	ON	OFF	ON	ON
204	ON	ON	OFF	OFF	ON	ON	OFF	OFF
205	ON	ON	OFF	OFF	ON	ON	OFF	ON
206	ON	ON	OFF	OFF	ON	ON	ON	OFF
207	ON	ON	OFF	OFF	ON	ON	ON	ON
208	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
209	ON	ON	OFF	ON	OFF	OFF	OFF	ON
210	ON	ON	OFF	ON	OFF	OFF	ON	OFF
211	ON	ON	OFF	ON	OFF	OFF	ON	ON
212	ON	ON	OFF	ON	OFF	ON	OFF	OFF
213	ON	ON	OFF	ON	OFF	ON	OFF	ON
214	ON	ON	OFF	ON	OFF	ON	ON	OFF
215	ON	ON	OFF	ON	OFF	ON	ON	ON
216	ON	ON	OFF	ON	ON	OFF	OFF	OFF
217	ON	ON	OFF	ON	ON	OFF	OFF	ON
218	ON	ON	OFF	ON	ON	OFF	ON	OFF
219	ON	ON	OFF	ON	ON	OFF	ON	ON
220	ON	ON	OFF	ON	ON	ON	OFF	OFF
221	ON	ON	OFF	ON	ON	ON	OFF	ON
222	ON	ON	OFF	ON	ON	ON	ON	OFF
223	ON	ON	OFF	ON	ON	ON	ON	ON
224	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
225	ON	ON	ON	OFF	OFF	OFF	OFF	ON
226	ON	ON	ON	OFF	OFF	OFF	ON	OFF
227	ON	ON	ON	OFF	OFF	OFF	ON	ON
228	ON	ON	ON	OFF	OFF	ON	OFF	OFF
229	ON	ON	ON	OFF	OFF	ON	OFF	ON
230	ON	ON	ON	OFF	OFF	ON	ON	OFF
231	ON	ON	ON	OFF	OFF	ON	ON	ON
232	ON	ON	ON	OFF	ON	OFF	OFF	OFF
233	ON	ON	ON	OFF	ON	OFF	OFF	ON
234	ON	ON	ON	OFF	ON	OFF	ON	OFF
235	ON	ON	ON	OFF	ON	OFF	ON	ON
236	ON	ON	ON	OFF	ON	ON	OFF	OFF
237	ON	ON	ON	OFF	ON	ON	OFF	ON
238	ON	ON	ON	OFF	ON	ON	ON	OFF
239	ON	ON	ON	OFF	ON	ON	ON	ON
240	ON	ON	ON	ON	OFF	OFF	OFF	OFF
241	ON	ON	ON	ON	OFF	OFF	OFF	ON
242	ON	ON	ON	ON	OFF	OFF	ON	OFF
243	ON	ON	ON	ON	OFF	OFF	ON	ON
244	ON	ON	ON	ON	OFF	ON	OFF	OFF
245	ON	ON	ON	ON	OFF	ON	OFF	ON
246	ON	ON	ON	ON	OFF	ON	ON	OFF
247	ON	ON	ON	ON	OFF	ON	ON	ON

Modbus Addresses 248-256 are reserved.

Figure 10: Modbus Switch Table for C-05820 Alternator. 4 of 4.

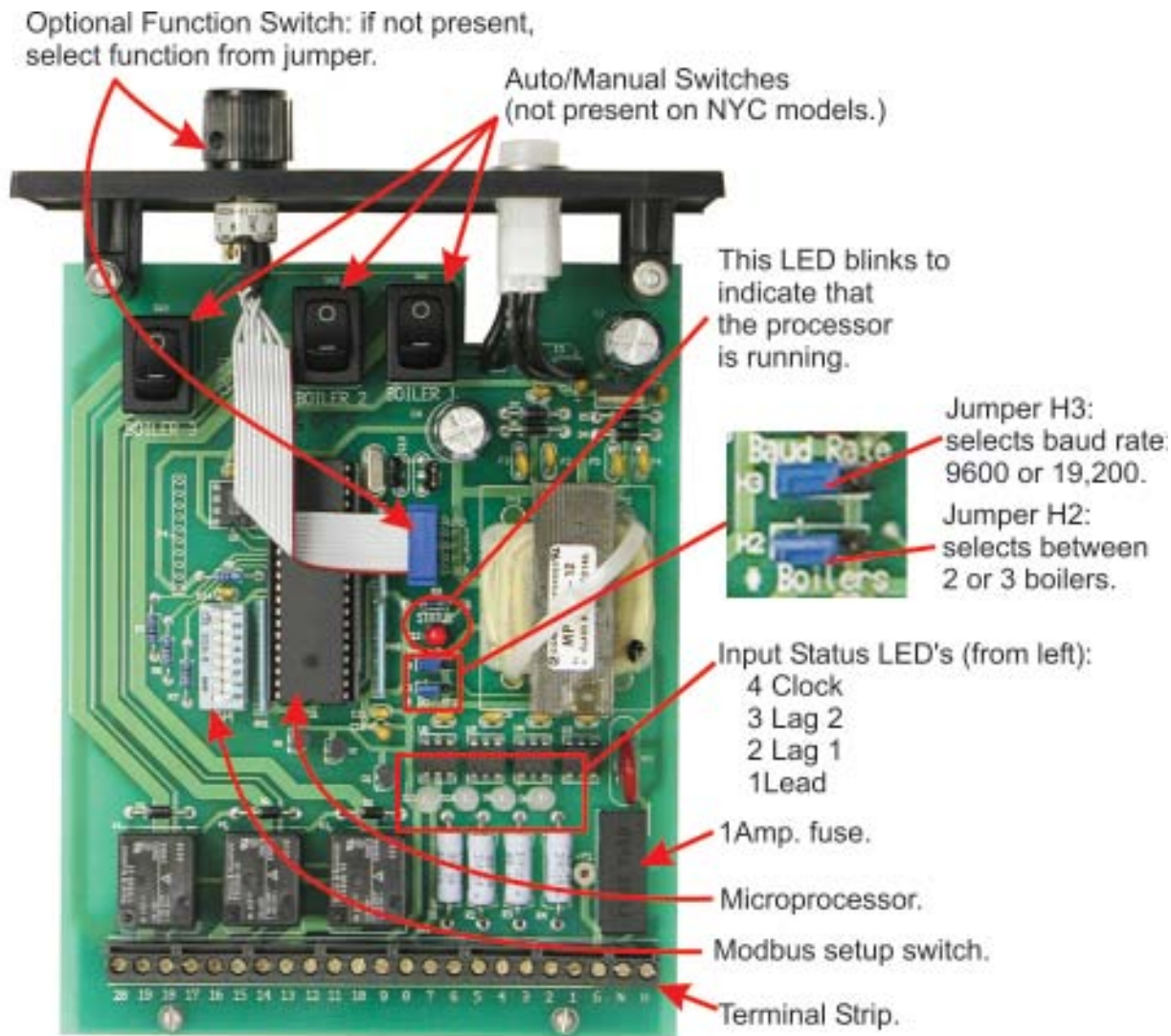


Figure 11: PC Board Components

IM C05820.01

Index

A

address, Modbus 10

B

bypass 9

C

clock, 7-day 9

communications port 10

contacts 8

L

lead boiler 9

lights, boiler status 9

limits, local boiler 9

M

Modbus – RTU Protocol 10

Modbus Communications 10

N

National Electrical Code 8

NYC DEP 9

R

repair 11

RS – 485 10

S

selector 9

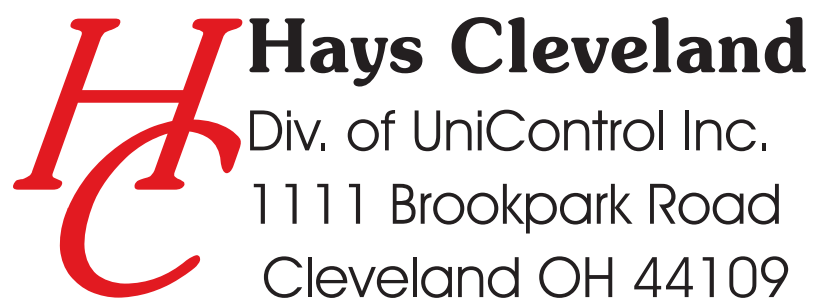
sequencing options 9

switch 5

switch, auto/manual 9

T

terminals 8



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