

**Autoflame**

**Mini Mk8 M.M.**

**Installation and Commissioning Guide**

**MK8微型控制模块安装和调试指南**

**AUTOFLAME**



# Mini Mk8 M.M.

## Installation and Commissioning Guide

## MK8微型控制模块安装和调试指南



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### **Important Notes**

#### **重要提示**

**A knowledge of combustion related procedures and commissioning is essential before embarking work on any of the M.M./E.G.A. systems. This is for safety reasons and effective use of the M.M./E.G.A. system. Hands on training is required. For details on schedules and fees relating to group training courses and individual instruction, please contact the Autoflame Engineering Ltd. offices at the address listed on the front.**

为了安全有效地使用控制模块/EGA系统，控制模块/EGA系统的操作人员必须具有与燃烧相关的流程和调试知识。我们要求使用者参加实践培训，请使用首页上Autoflame办公室通讯方式来详细了解团体培训和个别教学事宜。

### **Short Form - General Terms and Conditions**

#### **一般条款**

**A full statement of our business terms and conditions are printed on the reverse of all invoices. A copy of these can be issued upon application, if requested in writing.**

在所有发票背面都印有我们的商业条款全文。客户可书面申请获得我公司商业条款文件。

**The System equipment and control concepts referred to in this Manual MUST be installed, commissioned and applied by personnel skilled in the various technical disciplines that are inherent to the Autoflame product range, i.e. combustion, electrical and control.**

只有专员人员才能安装，调试和使用本手册所提及的系统设备和控制概念。他们必须精通Autoflame产品所涉及的各个技术学科，即:- 燃烧，电气和控制。

**The sale of Autoflame's systems and equipment referred to in this Manual assume that the dealer, purchaser and installer has the necessary skills at his disposal. i.e. A high degree of combustion engineering experience, and a thorough understanding of the local electrical codes of practice concerning boilers, burners and their ancillary systems and equipment.**

经销，购买或者安装本手册提及的Autoflame系统和设备的人员都要具有必要的专业知识，即:- 与锅炉，燃烧器和辅助系统/设备相关的丰富燃烧工程从业经验和全面电气行业规范知识。

**Autoflame's warranty from point of sale is two years on all electronic systems and components. One year on all mechanical systems, components and sensors.**

**Autoflame保修条款:- 对所有电子系统和部件实行两年售后保修；  
对所有机械系统和部件和感应器实行一年售后保修。**

**The warranty assumes that all equipment supplied will be used for the purpose that it was intended and in strict compliance with our technical recommendations. Autoflame's warranty and guarantee is limited strictly to product build quality, and design. Excluded absolutely are any claims arising from misapplication, incorrect installation and/or incorrect commissioning.**

保修前提：所有设备必需被用于预期使用目的并且严格符合我们的技术建议。Autoflame产品保修条款只适用于产品制造质量问题和设计问题。根据保修条款，Autoflame不接受由于错误操作，错误安装和/或调试导致的索赔请求。

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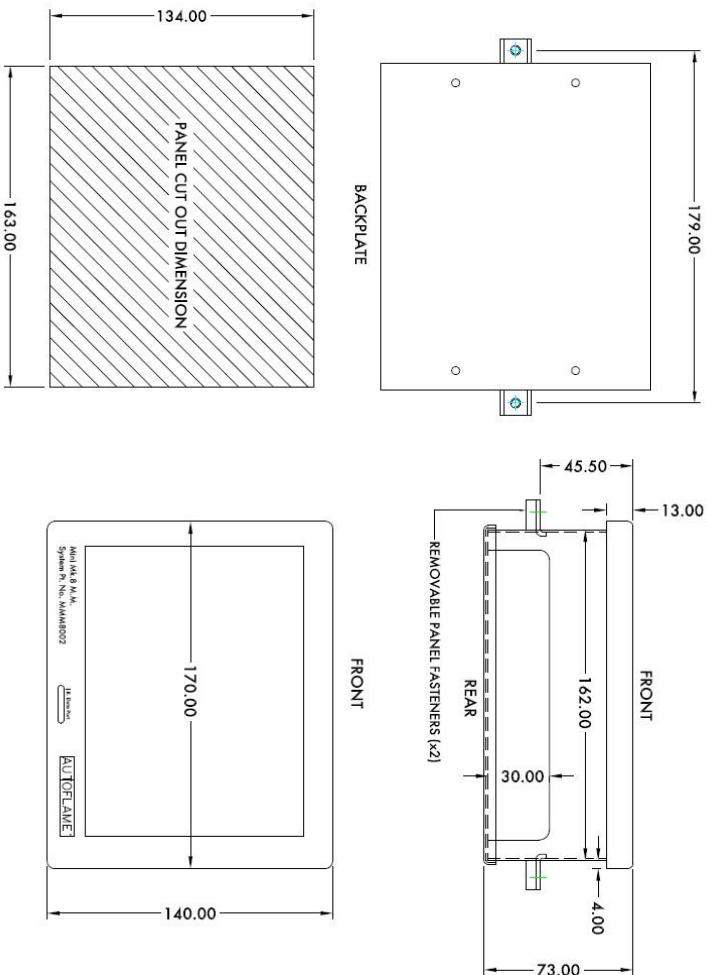
## 1 DIMENSIONS AND WIRING

## 尺寸和接线

### 1.1 Mini Mk8 M.M. MK8微型控制模块



#### 1.1.1 Fixing Holes and Dimensions 固定孔和尺寸

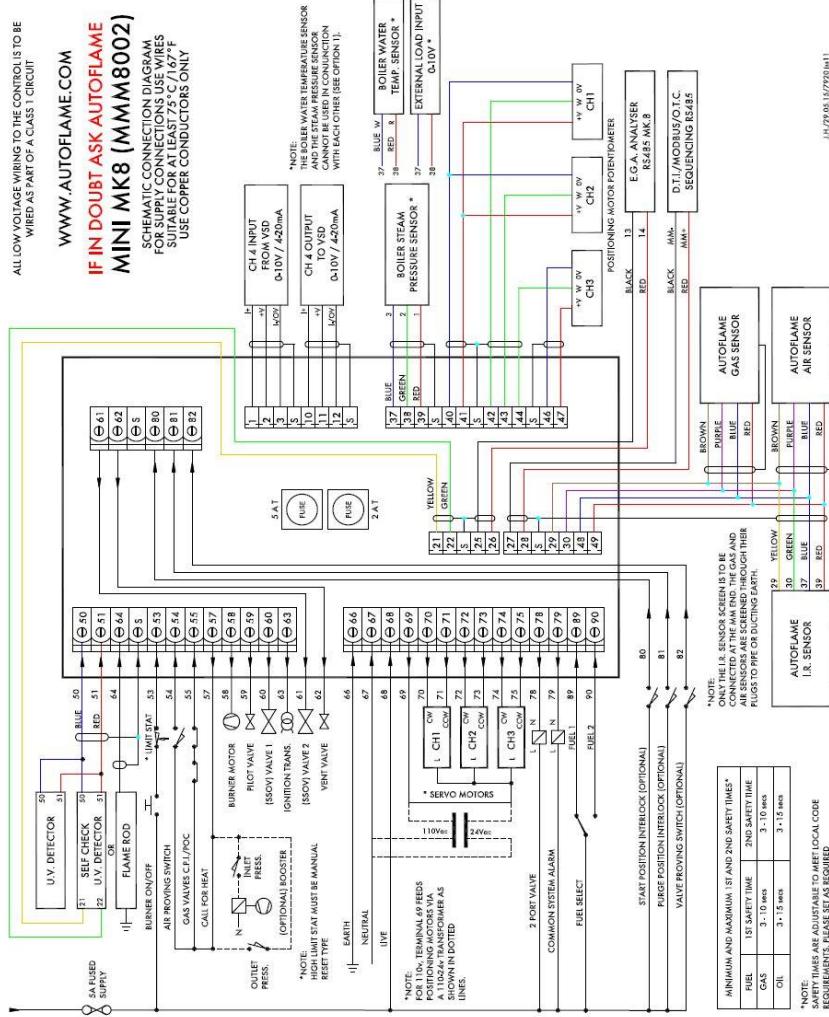


## 1.2 Wiring Schematic

### 配线线路图

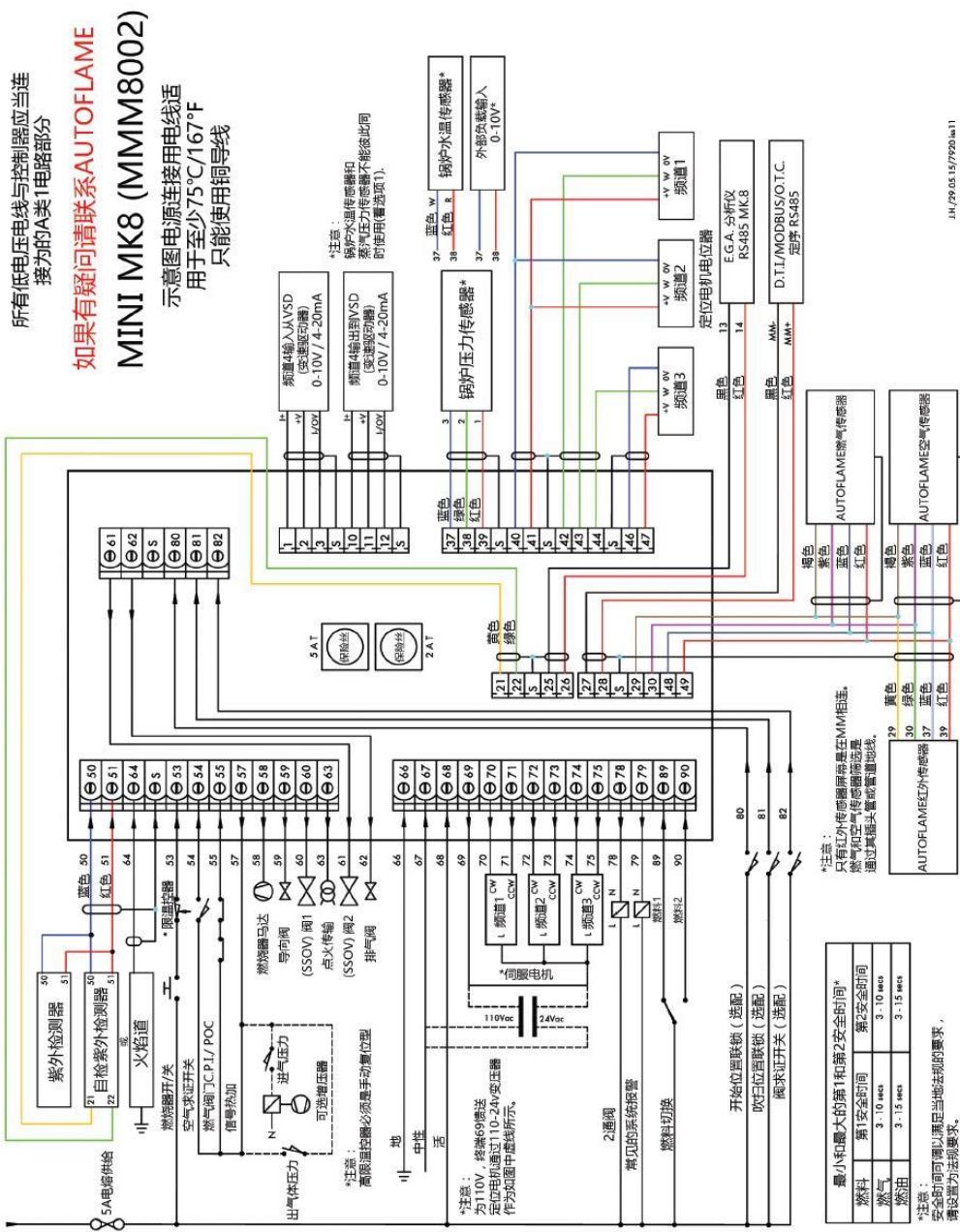
1 Dimensions and Wiring

#### 1.2 Wiring Schematic



# 1尺寸和接线

## 1.2 线路图



## 迷你MK8 M.M.安装和调试指南

### 1.3 Electrical Specifications

#### 电气规格

##### 1.3.1 Classifications

###### 等级

###### Classification according to EN298

###### 根据EN298的分级

Mains Supply: 230V, +10%/-15%}	47-63 Hz, unit max. consumption 140W
电源: 230V, +10%/-15%}	47-63 Hz, 单位最大用电量 140W
120V, +10%/-15%}	
120V, +10%/-15%}	
Climate: Min. Temperature	0C (32OF)
气候: 最低温度	0C (32OF)
Recommended Temperature	Less than 40C (104OF)
建议温度	低于40C (104OF)
Max. Temperature	60C (140OF)
最高温度	60C (140OF)
Humidity	0 to 90% non-condensing
湿度	0 to 90% 不冷凝
Storage: Temperature	-20 to 85C (-4 to 185OF)
储藏: 温度	-20 to 85C (-4 to 185OF)
Protection Rating:	The unit is designed to be panel mounted in any orientation and the front facia is IP65, NEMA4. The back of the unit is IP20, NEMA1.
防护等级:	控制模块的设计安装朝向是任意方向。控制模块的前部仪表板的防护等级是IP65, NEMA4; 控制模块背部的防护等级是IP20, NEMA1。

##### 1.3.2 Inputs and Outputs

###### 输入和输出

###### Inputs and Outputs

###### 输入和输出

230V Unit:

230V设备

Outputs	Terminal	57	250mA	Must be connected through contactor Max Load 5A
输出	端口	57	250mA	必须通过接触器连接, 最大荷载5A
		58	250mA	Must be connected through contactor
		58	250mA	必须通过接触器连接
		59	1A	0.6 power factor
		59	1A	0.6 功率因数
		60	1A	0.6 power factor
		60	1A	0.6功率因数
		61	1A	0.6 power factor
		61	1A	0.6功率因数
		62	1A	0.6 power factor
		62	1A	0.6功率因数
		63	1A	0.6 power factor
		63	1A	0.6 功率因数
		78	100mA	To drive relay only – switched neutral
		78	100mA	仅用于驱动继电器 – 切换至中性
		79	100mA	To drive relay/lamp only – switched neutral

---

		79	100mA	仅用于驱动继电器/灯 – 切换至中性
120V Unit:				
120V 设备				
Outputs 输出	Terminal 端口	57	250mA	Must be connected through contactor Max Load 5A 必须通过接触器连接，最大荷载5A
		58	250mA	Must be connected through contactor 必须通过接触器连接
		58	250mA	0.6 power factor 0.6 功率因数
		59	2A	0.6 power factor 0.6 功率因数
		60	2A	0.6 power factor 0.6 功率因数
		61	2A	0.6 power factor 0.6 功率因数
		61	2A	0.6 power factor 0.6 功率因数
		62	2A	0.6 power factor 0.6 功率因数
		62	2A	0.6 power factor 0.6 功率因数
		63	2A	0.6 power factor 0.6 功率因数
		63	2A	0.6 power factor 0.6 功率因数
		78	100mA	To drive relay only – switched neutral 仅用于驱动继电器 – 切换至中性
		78	100mA	To drive relay/lamp only – switched neutral 仅用于驱动继电器/灯 – 切换至中性
		79	100mA	To drive relay/lamp only – switched neutral 仅用于驱动继电器/灯 – 切换至中性
		79	100mA	To drive relay/lamp only – switched neutral 仅用于驱动继电器/灯 – 切换至中性

**Note:**

**注意:**

1. The high and low voltage connections are not safe to touch. Protection against electric shock is provided by correct installation. **CAUTION – ELECTRIC SHOCK HAZARD.**

用手触摸高压和低压连接是危险行为。正确安装电气设备可以防止触电事故。**警告：触电危险。**

2. Control voltage cabling should be maximum 10m, screened (if not screened then less than 1m, however servomotors can be unscreened up to 10m)

控制电压电缆的最大长度应为10m，经屏蔽（若未屏蔽应短至1米）；伺服马达的未屏蔽电缆最大长度可为10m。

3. Any cabling over 10m must have additional surge protection.

所有超过10m的电缆必须配备电涌保护。

4. Low voltage cables should be screened cable as specified in section 1.3.3.

低压电缆应符合章节1.3.3规定的经屏蔽电缆。

5. The burner ‘High Limit Stat’ must be a manual reset type.

燃烧器的“上限启停控制器”必须为手动复位型。

**Note:** There is a lid (back plate) fitted onto the back of the Mini Mk8 M.M. with a Warning label to prevent any unauthorised fuse replacements.

注意：在MK8微型控制模块背部装有一个盖板。盖板上的标识明确指出更换保险丝操作前必需获得授权。

### **1.3.3 Cable Specifications**

#### **电缆规范**

##### **High/ Control Voltage**

###### **高/控制电压**

Screened cable should not exceed 10m and unscreened cable should not exceed 1m. The ionisation/flame rod cable must be shielded to prevent interference with other cables, as it is a high voltage and high frequency signal.

经屏蔽的电缆长度不应超过10m，未经屏蔽的电缆长度不应超过1m。为防止干扰，由于离子/火焰感应棒电缆将产生高压和高频信号，离子/火焰感应棒电缆必须经过屏蔽。

##### **Low Voltage**

###### **低压**

The screened cable used from the M.M. to the servomotors and detectors must conform to the following. The screened cable used for low voltage wiring from the M.M. to the servomotors, detectors and variable speed drive must conform to the following specification:

控制模块，伺服马达，检测器和各种速度传动装置的已屏蔽低压电缆要符合以下规范：

16/0.2mm PVC insulated overall braid, screened, PVC sheathed.

16/0.2mm PVC 绝缘编织层，屏蔽电缆，PVC电缆护皮。

② \* Sixteen wires per core

每芯16线

② \* Diameter of wires in each core 0.2mm

芯内电线直径0.2mm

② \* Rated at 440V AC rms at 1600Hz

额定交流电压440V rms 1600Hz

② \* DEF 61-12 current rating per core 2.5A

DEF 61-12每芯额定电流2.5A

② \* Maximum operating temperature 70C (158F)

最高工作温度70C (158F)

② \* Nominal conductor area 0.5sq mm per core

公称导体面积 – 每芯0.5平方米

② \* Nominal insulation radial thickness on core 0.45mm

每芯公称绝缘层径向厚度 – 0.45mm

② \* Nominal conductor diameter per core 0.93mm

每芯公称导体直径0.93mm

② \* Nominal core resistance at 20C. 40.1Ω/1000m

20C时电缆公称电阻值 – 40.1Ω/1000m

② \* Nominal overall diameter per core 1.83mm

每芯公称总直径 – 1.83mm

② \* Fill factor of braid screen 0.7

编织层填充因子 0.7

② \* Equivalent imperial conductor sizes 14/0.0076

等效英制导体尺寸 14/0.0076

Use the number of cores suitable for the application. A universal part numbering system appears to have been adopted for this type of cable as follows:

根据实际使用需要来选用合适的电缆。以下是通用的电缆编号方法：

---

16-2-2C 2 Core

16-2-2C 2芯

16-2-3C 3 Core

16-2-3C 3芯

16-2-4C 4 Core

16-2-4C 4芯

16-2-6C 6 Core

16-2-6C 6芯

(5 Core not readily available)

(无现成的5芯电缆)

**Note:** If using 4 Core cable and interference is detected, use 2 sets of 2 Core.

**注意:** 如果使用4芯电缆时检测到相互干扰，就应使用两套2芯电缆。

#### Data Cable

#### 数据电缆

Data cable must be used for connections between M.M.s for sequencing applications and between M.M.s and E.G.A.s and for connection between M.M.s and D.T.I.

数据电缆用于控制模块的排序连接，控制模块与EGA的连接，以及控制模块与DTI的连接。

Types of data cable that can be used:

可选用的数据电缆类型：

1 Beldon 9501 for 2-core shielded cable (1 twisted pair)

Beldon 9501 用于2芯屏蔽电缆（一对双绞线）

2 Beldon 9502 for 4-core shielded cable (2 twisted pairs)

Beldon 9502 用于4芯屏蔽电缆（两对双绞线）

3 STC OS1P24

STC OS1P24

Samples are available upon request. Low voltage and data cable can be ordered directly from Autoflame Engineering, please contact Autoflame Sales.

客户可询问和获得样品。客户可直接向Autoflame工程有限公司采购低压电缆和数据电缆。请联系Autoflame公司销售部。

#### 1.3.4 Terminals Description

#### 接线端子描述

S All terminals marked S are internally connected. They are provided for connections to the various screened cables.

所有标记为S的接线端子都已内部连接。这些端子将和各屏蔽电缆相连接。

1 Current Input, 0-20mA/ 4-20mA. For channel 4 only. Can be connected to the current output of a VSD or tachometer system or 4-20mA servomotor feedback

电流输入，0-20mA/ 4-20mA。仅用于4频道，该端子可与变速驱动或者转速计系统的电流输出信号连接，或者和4-20mA伺服马达的反馈信号连接。

2 Voltage Input, 0-10V. For channel 4 only. Can be connected to the voltage output of a VSD or tachometer system or 4-20mA servomotor feedback

电压输入，0-10V。仅用于4频道，该端子可与变速驱动或者转速计系统的电压输出信号连接，或者和4-20mA伺服马达的反馈信号连接。

3 Common for Terminals 1 or 2

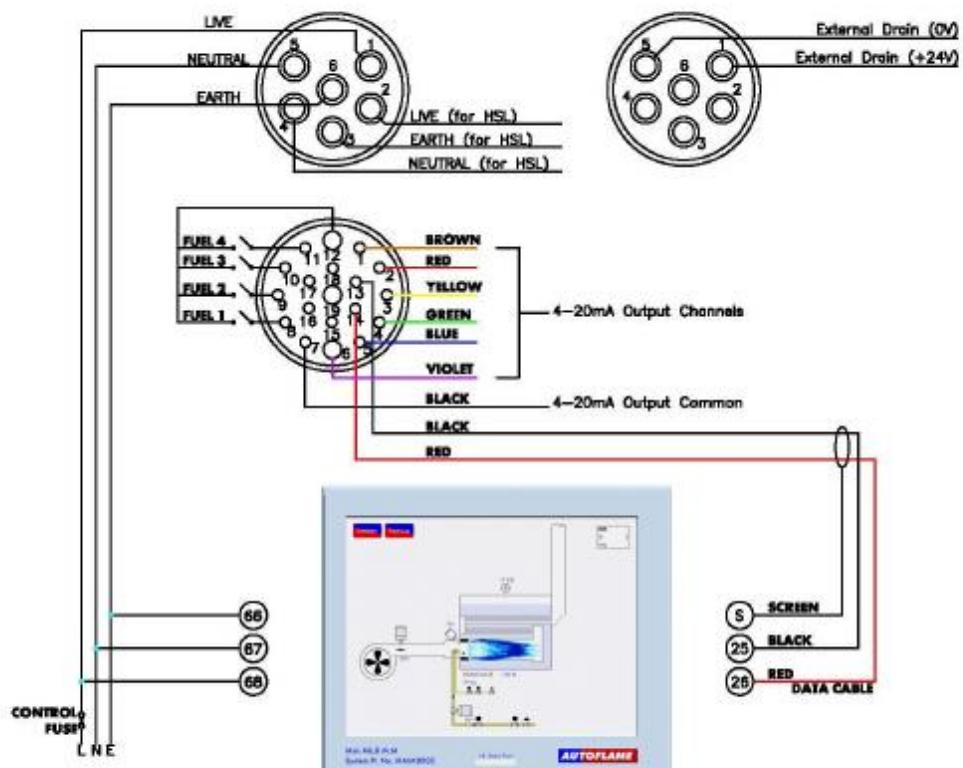
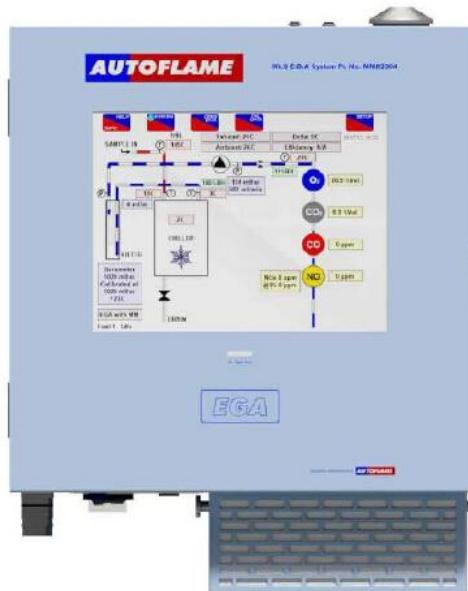
- 
- 与端子1和端子2通用。
- 10 Current Output, 0-20mA/ 4-20mA. For channel 4 only. Can be connected to the current input of a VSD or 4-20mA servomotor feedback  
电流输出, 0-20mA/ 4-20mA。仅用于4频道, 该端子可与变速驱动的电流输入信号口连接, 或者和4-20mA伺服马达的反馈信号口连接。
- 11 Voltage Output, 0-10V. For channel 4 only. Can be connected to the voltage input of a VSD or 4-20mA servomotor feedback  
电压输出, 0-10V。仅用于4频道, 该端子可与变速驱动的电压输入信号口连接, 或者和4-20mA伺服马达的反馈信号口连接。
- 12 Common for Terminals 10 or 11  
与端子10或者端子11通用
- 21, 22 Connections to an Autoflame self-check UV sensor  
与Autoflame自检紫外线传感器连接
- 25, 26 Communications port connections to an Exhaust Gas Analyser (E.G.A.)  
与尾气分析仪(E.G.A.)相连的通讯接口
- 27, 28 Communications port connections for D.T.I. and/or IBS, or Modbus  
与D.T.I. 和/或 IBS, 或者Modbus相连的通讯接口
- 29, 30 Digital communications connections to an Autoflame IR scanner (MM70017),  
Autoflame air pressure sensor and/or Autoflame gas pressure sensor  
与Autoflame红外线扫描仪(MM70017), Autoflame 空气压力感应器和/或Autoflame 燃气压力感应器相连的数字通讯接口。
- 37, 38 (39) Connections to an Autoflame boiler temperature detector (pressure)  
与Autoflame锅炉温度(压力)检测器相连的接口
- 40 0V supply to channel 1 and channel 2 servomotors  
与频道1和频道2伺服马达相连的0v电源
- 41 +12V supply to channel 1 and channel 2 servomotors  
与频道1和频道2伺服马达相连的+12V电源
- 42 Signal from channel 1 servomotor, indicating position  
频道1伺服马达的信号, 表示位置
- 43 Signal from channel 2 servomotor, indicating position  
频道2伺服马达的信号, 表示位置
- 44 Signal from channel 3 servomotor, indicating position  
频道3伺服马达的信号, 表示位置
- 46 0V Supply to channel 3 servomotor  
与频道3伺服马达相连的0V电源
- 47 +12V Supply to channel 3 servomotor  
与频道3伺服马达相连的+12V电源
- 48, 49 +15V connections to an Autoflame IR scanner (MM70017), Autoflame air pressure  
sensor and/or Autoflame gas pressure sensor  
与Autoflame 红外线扫描仪 (MM70017), Autoflame 空气压力感应器和/或  
Autoflame 燃气压力感应器相连的+15V电压接口
- 50, 51 Connections to an Autoflame UV sensor  
与Autoflame紫外线感应器相连的接口
- 64 Connections to a flame rod  
与火焰感应棒相连的接口
- 53 Mains voltage input – burner on/off signal, running interlock circuit  
输电干线电压输入 – 燃烧器启闭信号, 运行连锁电路
- 54 Mains voltage input – safety circuits, e.g. air proving  
输电干线电压输入 – 安全电路, 例如空气校验
- 55 Mains voltage input - proving circuits, e.g. gas valve proof of closure

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	输电干线电压输入 – 检验用电路, 例如燃气阀门关闭检验
57	Mains voltage output – call for heat
	输电干线电压输出 – 要求热量
58	Mains voltage output – burner motor
	输电干线电压输出 – 燃烧器马达
59	Mains voltage output – start/pilot valve
	输电干线电压输出 – 启动阀/导阀
60	Mains voltage output – main fuel valve 1
	输电干线电压输出 – 主燃料阀1
61	Mains voltage output – main fuel valve 2
	输电干线电压输出 – 主燃料阀2
62	Mains voltage output – vent valve
	输电干线电压输出 – 排气阀
63	Mains voltage output – ignition transformer
	输电干线电压输出 – 点火变压器
66	Mains supply – earth
	干线供电 – 接地
67	Main supply – neutral
	干线供电 – 中性
68	Mains supply – live/hot
	干线供电 – 火线
69	Mains voltage output, power to servomotors and/or servomotor stepdown transformer
	干线电压输出, 向伺服马达和/或伺服马达变压器供电
70	Switched neutral – drives channel 1 servomotor clockwise
	处于中性位 – 驱动频道1伺服马达顺时针转动
71	Switched neutral – drives channel 1 servomotor counter clockwise
	处于中性位 – 驱动频道1伺服马达反时针转动
72	Switched neutral – drives channel 2 servomotor clockwise
	处于中性位 – 驱动频道2伺服马达顺时针转动
73	Switched neutral – drives channel 2 servomotor counter clockwise
	处于中性位 – 驱动频道2伺服马达反时针转动
74	Switched neutral – drives channel 3 servomotor clockwise
	处于中性位 – 驱动频道3伺服马达顺时针转动
75	Switched neutral – drives channel 3 servomotor counter clockwise
	处于中性位 – 驱动频道3伺服马达反时针转动
78	Switched neutral – 2-port valve for IBS operation
	处于中性位 – 2端口阀门, 用于IBS运行 (智能锅炉排序)
79	Switched neutral – alarm output for M.M. lockout/M.M. error/E.G.A. error.
	处于中性位 – 控制模块锁定/模块错误/EGA错误的警报输出
80	Start position interlock/ night setback input/ reduced setpoint input
	初始位置连锁/夜间调低值输入/降低设定点值输入
81	Purge interlock/ low flame hold input
	吹扫连锁/低火焰保持信号输入
82	Warming stat/ valve proving mains input
	加温控制点/阀门校验干线输入
89	Mains voltage input – selects fuel 1 curve
	干线电压输入 – 选择燃料1曲线
90	Mains voltage input – selects fuel 2 curve
	干线电压输入 – 选择燃料2曲线

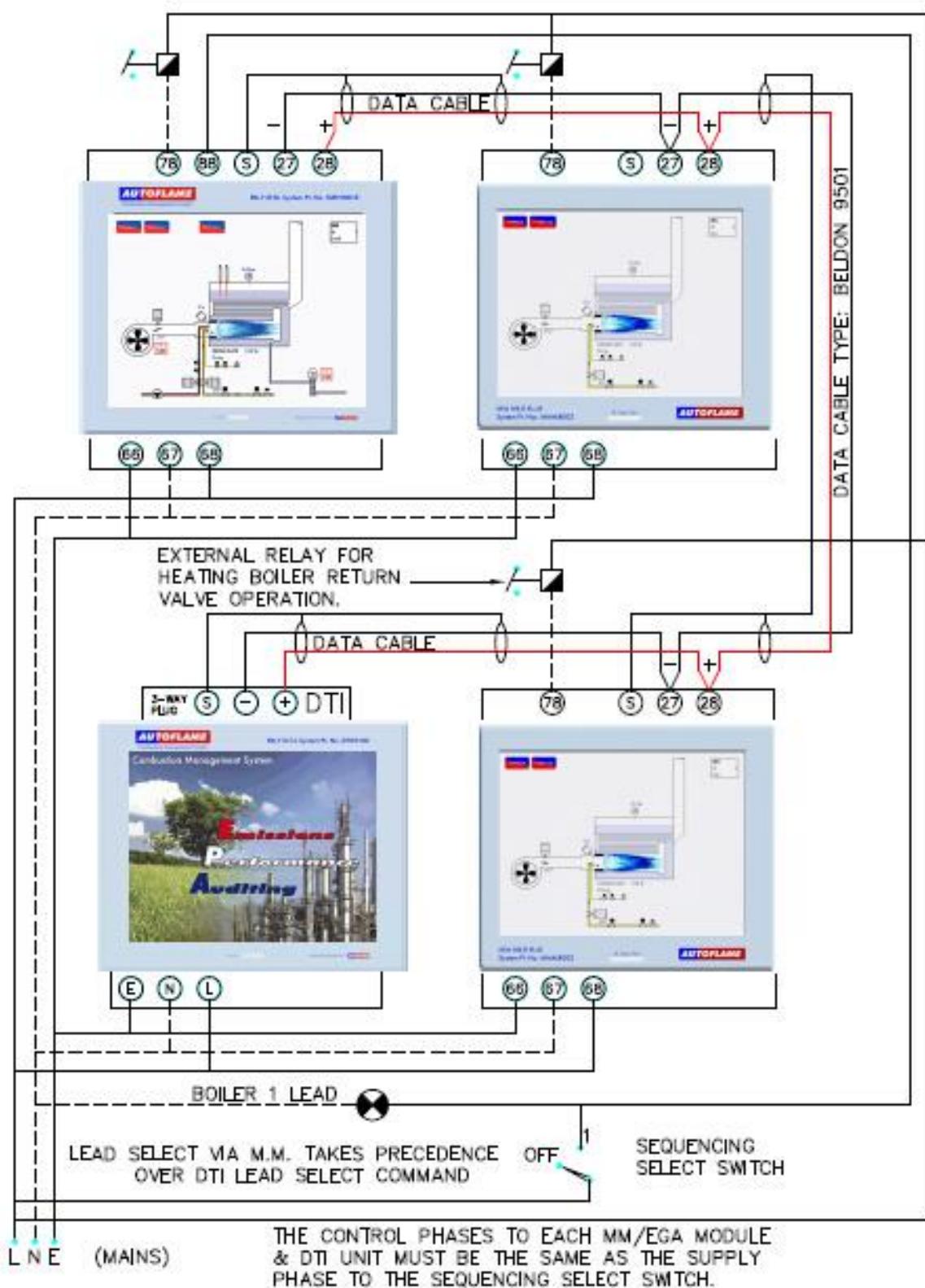
## 1.4 Connection Between Mini Mk8 M.M. and Mk8 E.G.A.

Mk8微型控制模块与Mk8 E.G.A.的连接



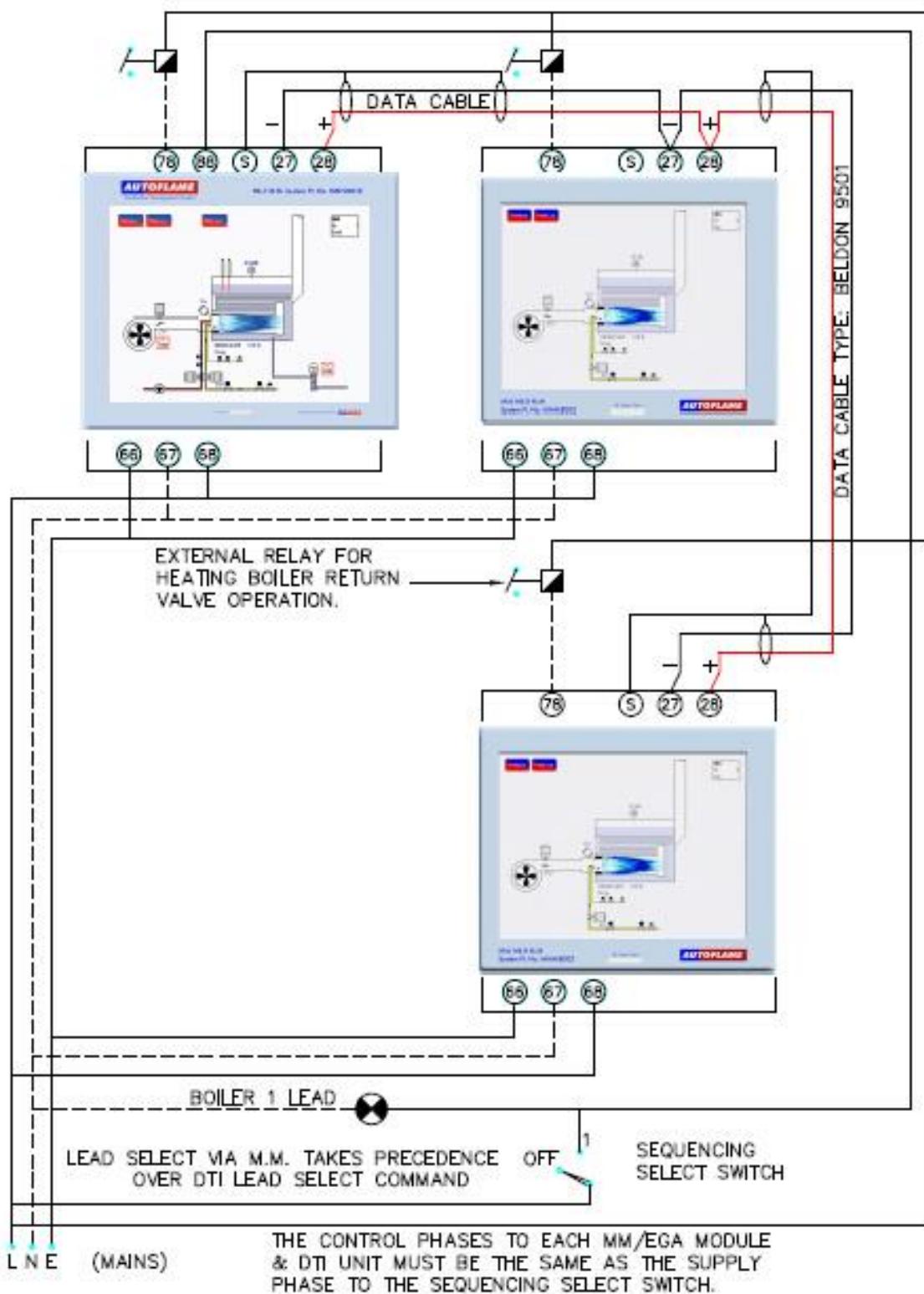
## 1.5 Connection Between Mini Mk8 M.M. and Mk7 D.T.I.

Mk8微型控制模块与Mk7 D.T.I.的连接



## 1.6 Sequencing Connection Diagram

多台Mk8微型控制模块排序连接图



## 2 OPTIONS AND PARAMETERS

### 选项和参数

#### 2.1 Options

##### 选项

**Note:** The Options and Parameters must only be changed by factory trained and certified technicians who have a thorough appreciation of the Autoflame combustion systems and the combustion process in general. Any person changing these set-ups who does not have the correct factory training and understanding of these settings/adjustments may place themselves and others in a potentially dangerous situation.

注意：只有接受过工厂培训的持证人员才能更改选项和参数设置，他们应该整体充分理解Autoflame的燃烧系统和燃烧过程。未接受过培训和不理解这些设置项的人员所做的任何选项和参数更改会给自身和他人带来潜在危险。



CH1, CH2, CH3 and CH4, refer to the rows of  buttons respectively starting with CH1 at the top.



CH1, CH2, CH3和CH4分别指的是各行按钮 ， CH1按钮在最顶行。

The options and parameters are all viewable while the M.M. is in run mode and the burner is firing; a number of options and parameters can be adjusted through Online Changes. All Burner Control (BC) options/parameters can only be changed in Commissioning mode.

在控制模块运行和燃烧器燃烧期间，操作者可以在屏幕上读取所有选项和参数值或者在线更改一些选项和参数值。但是所有燃烧器控制（BC）选项/参数的更改只能在调试模式下进行。

Through Commissioning Mode, all the options and parameters can be adjusted according to the application.

在调试模式下，操作者可以根据使用情况来调节所有的选项和参数。



Power up the unit. If the M.M. has already been commissioned, press  when the system starts up. If the system is not already commissioned, the M.M. will go to commissioning mode automatically.



向控制模块通电。如果控制模块已被调试过，在系统启动时应按下  按钮；如果控制模块未被调试过，控制模块将自动进入调试模式。

## Enter Commissioning Password

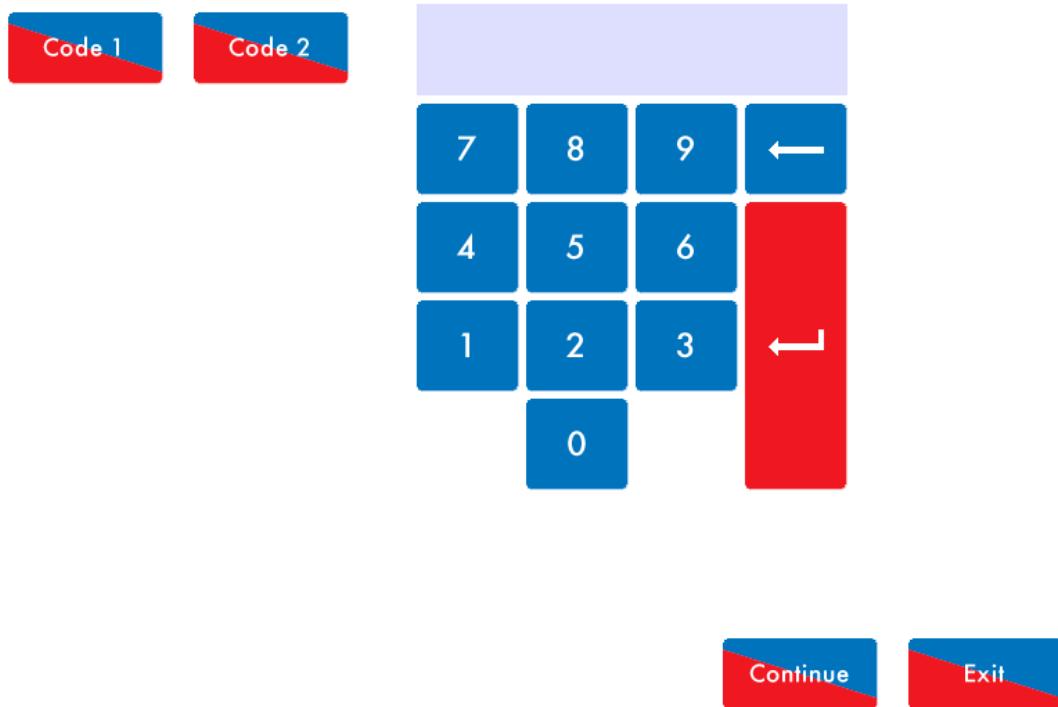


Figure 2.1.i Enter Password 输入密码

“Enter Commissioning Password” is displayed. Use the keypad to enter the password, then press . Press on or to change the value of an incorrect entry.

屏幕出现“输入调试密码”界面。用小键盘输入密码，然后按下 按钮。在输错密码时可按下 按钮或者 按钮来进行更改。

**Note:** The commissioning password should not be distributed to anyone who is not a factory trained and a certified engineer.

**注意：**不得向未经过培训的人员或者非持证人员泄漏调试密码。

**System Information**  
Fuel 1 : Gas  
Times Commissioned: 1

Serial:  
Bootloader:  
BC:  
MM:  
Display:

## Commission Mode



Figure 2.1.ii Commission Mode 调试模式

The “Commission Mode” screen gives information on which fuel is selected, how many times the unit has been commissioned, serial number, bootloader, and BC, MM and Display software.

操作者在“调试模式”界面上可以读取燃料信息，设备调试次数，序列号，引导装载程序和燃烧器控制信息，控制模块和显示软件信息，等等。

In the Commission Mode screen, all the options/ parameters can be adjusted, the gas pressure sensor can be commissioned, the commissioned IR data can be uploaded and the fault logs can also be viewed.

操作者在“调试模式”界面上可进行选项/参数值的更改，燃气压力感应器的调试，红外线扫描仪数据的上传，和故障记录查询。

**Note:** The Times Commissioned is for the total system and will increment with every fuel commission, single point change and commission upload.

**注意：**设备调试次数是对整个系统而言。设备调试次数包括了每一次燃料调试，单点变更，和调试数据上传。

## **Commission Mode**

Options	Parameters							
#	Description	Value						
1	MM: Boiler temperature/pressure sensor type	Temperature						
2	MM: Modulating Motor Travel Speed Limit	10.0 degrees per second						
3	Unused: Option 3	0						
4	Unused: Option 4	0						
5	MM: Purge position	... at OPEN position						
6	PID: Proportional Band	10 °C						
7	PID: Integral Time	60 seconds						
8	MM: Servomotor Channels	Channels 1 & 2						
9	MM: Internal Stat Operation	... below setpoint						
10	MM: Burner Switch-Off Offset	3 °C						
11	MM: Burner Switch-On Offset	3 °C						
12	EGA: EGA Functionality	Not optioned						
13	EGA: EGA Error Response	... stops, alarm active						
14	Unused: Option 14	0						
All	MM	PID	EGA	DTI	BC			

Figure 2.1.iii Options 选项

Any number of options and parameters can be changed at one time. By pressing MM, PID, EGA, DTI or BC at the bottom of the screen, the options/parameters can be grouped together by feature.

操作者每次能更改任意数量的选项和参数。通过选择屏幕下方的MM, PID, EGA, DTI 或者 BC标签，操作者可浏览根据特点分组的选项和参数信息。

When the changes have been made to suit the application's needs, press **Exit** to go back to the Commission Mode screen.

在完成所需的更改后，按下退出键回到调试模式界面。

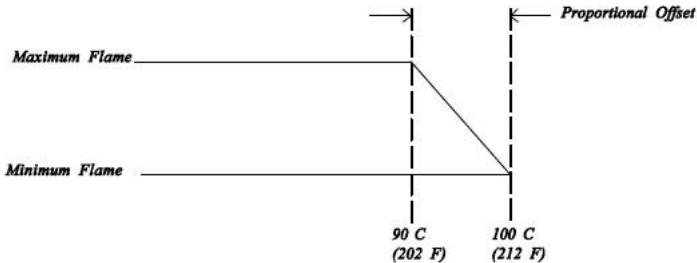
A full list of options are detailed on the next pages. Options/ parameters 110 – 160 are the burner control settings and are safety critical; these must be entered the same for both the option and parameter value. If these BC options and parameters do not match, there will be an option/parameter conflict lockout.

从下页开始列出了完整选项列表。选项/参数110 – 160是燃烧器控制设置（也是安全方面的关键设置），这些选项/参数必须在数值上保持相同。燃烧器控制设置的选项/参数值不同会导致系统锁定。

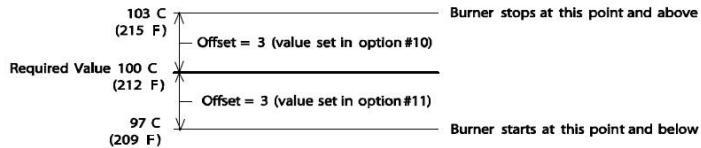
To set all the options and parameters to the default values and erase the commissioning data, set option/ parameter 160 to 5. The M.M. will then automatically restart.

将选项/参数的第160项设置成5可以恢复选项/参数的默认值和清除所有已调试数据。随后控制模块将自动重启。

Option No.	Factory Setting	Option value	Description
选项编号	工厂设置值	选项数值	描述
1	3		<b>Boiler Temperature/Pressure Sensor Type</b> 锅炉温度/压力感应器类型
	0	Temperature (MM10006) 0 - 400 C (0 - 752 F) 温度(MM10006) 0 - 400 C (0 - 752 F)	
	1	Low pressure (MM20020) 0.2 - 3.8 Bar (15 - 55PSI) 低压(MM20020) 0.2 - 3.8 Bar (15 - 55PSI)	
	2	Medium pressure (MM10008) 2 - 23 Bar (30 - 330 PSI) 中压(MM10008) 2 - 23 Bar (30 - 330 PSI)	
	3	High pressure (MM10009) 2 - 38 Bar (30 - 550 PSI) 高压(MM10009) 2 - 38 Bar (30 - 550 PSI)	
	4	Extra high pressure (MM10017) 0 - 100 Bar (0 - 1450 PSI) 超高压(MM10017) 0 - 100 Bar (0 - 1450 PSI)	
	5	External temperature (voltage input) - range set by parameters 52 - 56 外部温度 (电压输入) - 通过参数52 - 56来设置范围	
	6	External pressure (voltage input) - range set by parameters 52 - 56 外部压力 (电压输入) - 通过参数52 - 56来设置范围	
			<b>Note:</b> External Load Sensor to be wired low voltage on Terminal 37, high voltage on Terminal 38. <b>注意:</b> 外部荷载感应器的低压电线被接到端子37，高压电线被接到端子38。
2	15		<b>Modulating Motor Travel Speed Limit:</b> If the speed of the motor is too fast, then decrease the value, and vice versa. At times other than modulation, the motors move at full speed or at the value set in option 75. Movement is limited by the slowest channel i.e. the slowest moving motor. <b>控制马达的运行速度极限:</b> 如果马达运行速度太快，就降低该数值，反之则升高该数值。除了在控制期间，马达以全速运行或者以选项75的数值运行。运行受到最慢频道的限制 – 即：运行最慢的马达。
	6-100		
3	0		<b>Unused</b> 未使用
4	0		<b>Unused</b> 未使用
5	1		<b>Purge Position:</b> This selects the purge position. (Applicable to channels 1-3 when selected; see options 67 - 70). VSD channel 4, if optioned, purges at open position regardless of the option setting. It also applies to post purge if option 118 is set to a value greater than 0. <b>吹扫位置:</b> 该选项用于选择吹扫位置（适用于频道1 – 3，参见参数67 – 70）。无论怎样设置选项，变速驱动频道4的吹扫位置始终处于开放位。如果选项118的设置值大于0，吹扫位置也适用于后吹扫。
	0		Selected channels purge at HIGH position (high fire position) 所选频道在高位吹扫（高火位置）
	1		Selected channels purge at OPEN position (full span of servomotor as entered during commissioning) 所选频道在开启位吹扫（伺服马达按照调试数据满程运行）
6	10		<b>Proportional Band:</b> This option sets the proportional band, which is an offset below the setpoint. When the actual value reaches this band the burner will begin to modulate as it approaches the setpoint. <b>比例带:</b> 本选项为比例带设置，即设定点之下的补偿值。当实际值进入比例带数值范围，燃烧器将进入控制模式直到达到设定点。 <i>Example of proportional band offset: Required setpoint = 100degC, Proportional offset = 10degC (i.e. option 6 set to value 10).</i> <b>比例带补偿值举例:</b> 所需设定点 = 100度，比例带补偿值 =10 度 (即：选项 6 被设置成 10).

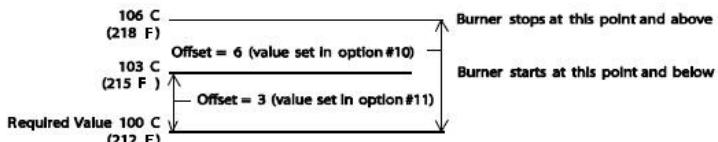


		5 - 2000	If Centigrade, Fahrenheit or PSI units effective. 使用单位是摄氏, 华氏或者磅/平方英寸
		0.5 - 200.0	If Bar units effective. 使用单位是巴
		<b>Note:</b> Decreasing this value could lead to overshooting of the required setpoint. Increasing this value may cause the burner to modulate too early, taking a longer time to reach the required setpoint.	
		注意：降低这个数值可能会导致燃烧器运行超过设定点。提高这个数值会导致燃烧器过早进入控制模式从而需要更长时间到达设定点。	
7	60	<b>Integral Time:</b> Every 'n' seconds, 10% of the present offset from setpoint value is added (when below setpoint) or subtracted (when above setpoint) to the present proportional value. The value of 'n' is the number of seconds set in this option. It is possible to set this option to 'off'. If the Integral Time is turned there will be no integral control.	
		积分时间：每隔'n'秒，系统将自动添加10%的补偿值（当位于设定点之下）或者减少10%的补偿值（当位于设定点之上）。本选项设定'n'的数值。可选择关闭该选项，关闭积分时间选项意味着不执行整体控制。	
	0	0	Disabled 关闭
	1 - 250	1 - 250	Seconds 秒
8	0	<b>Servomotor Channels:</b> Channel 1 is always enabled for fuel; this option sets the channels in use. 伺服马达频道：频道1用于燃料。本选项设定所使用的频道。	
	0	0	Channels 1 & 2. 频道1 & 2
	1	1	Channels 1, 2 & 3. 频道1, 2 & 3
		<b>Note:</b> If Option 8 is changed after commissioning then the M.M. will need to be re-commissioned unless this option is returned to its previous value.	
		注意：如果在调试后更改选项8数值，就需要重新调试控制模块，除非将选项8恢复到先前的数值。	
9	1	<b>Internal Stat Operation:</b> The 'internal stat' turns the burner on and off according to the actual value relative to the required setpoint. There are three settings for this option. The first keeps the 'internal' stat' closed all the time. In this instance, a 'working stat' must be fitted to the boiler. The second setting opens the 'internal stat' at an offset above the required setpoint and closes it at an offset below the required setpoint. The third setting opens the 'internal stat' at an offset above the required setpoint and closes it at an offset also above the required setpoint. The offset value are set in options Options and 10 and 11.	
		内部启停控制点：“内部启停控制点”会根据实际值和设定点的关系来控制燃烧器的启停。该选项有三个设置。第一是保持“内部启停控制点”的全程关闭，这时在锅炉上会配有其他“启停装置”。第二是在设定点上方补偿值处开启启停控制，在设定点下方补偿值处关闭启停控制。第三是在设定点上方补偿值处开启启停控制，在设定点上方另一个补偿值处关闭启停控制。选项10和11可以设置这些补偿值的数值。	
	0	0	Internal stat always closed. 保持“内部启停”全程关闭。
	1	1	Burner operates below setpoint. 燃烧器在设定点之下运行
	2	2	Burner operates above setpoint. 燃烧器在设定点之上运行
		<i>Option 9 = 1, e.g. using 100 C (212 F) for required setpoint.</i> <i>在下例中选项9=1, 100 C (212 F)是设定点</i>	



*Option 9 = 2, example using 100 C (212 F). Required setpoint.*

在下例中选项9 =2, 100 C (212 F)是设定点



10 3

**Burner Switch-Off Offset:** Only relevant if option 9 is set to 1 or 2.

**燃烧器关闭的补偿值:** 该选项在选项9被设为1或2时有效。

2-1000 If Centigrade, Fahrenheit or PSI units effective

使用单位是摄氏, 华氏或者磅/平方英寸

0.2 -  
100.0 If Bar units effective

使用单位是巴

11 3

**Burner Switch-On Offset:** Only relevant if option 9 is set to 1 or 2.

**燃烧器开启的补偿值:** 该选项在选项9被设为1或2时有效。

2 - 1000 If Centigrade, Fahrenheit or PSI units effective

使用单位是摄氏, 华氏或者磅/平方英寸

0.2 -  
100.0 If Bar units effective

使用单位是巴

12 0

**E.G.A. Functionality:** If this option has a setting of 2 or 3, then the E.G.A. will trim once this has been added. The trim is applied to channel 2 air damper.

**E.G.A.功能:** 该选项值为2或3时, E.G.A.在安装好后就开始调节。调节对象是频道2空气挡板。

0 Not optioned.

选项关闭

1 Monitoring only - no E.G.A. errors will be generated regardless of option 13.

仅监视 – 不管选项13数值是多少, 不生成E.G.A.错误

2 Applies trim.

执行调节

3 Applies trim, combustion limits tested.

执行调节, 测试燃烧极限

**Note:** If option12 is set to 0 or 1, then the M.M. is commissioned without trim, however trim can be added at a later date by changing option 12 to 2 or 3 in online changes, and then going through single point change to add the trim data for each fuel-air position.

**注意:** 如果选项12的值是0或1, 控制模块只做燃烧器控制但不做EGA调节。操作者以后仍然可以在线上将选项12更改成2或3, 然后在线单点更改和添加各个燃料 – 空气位的调节数据。

13 0

**E.G.A. Error Response:** This sets the M.M. operation on terminal 79 for when an E.G.A. error occurs.

**E.G.A.错误响应:** 该选项控制终端79在发生E.G.A.错误时的运行。

0 On error burner stops, alarm active.

发生E.G.A.错误时, 燃烧器停止, 警报响起

1 On error burner runs, alarm not active.

发生E.G.A.错误时, 燃烧器运行, 警报不响起

2 On error burners runs, alarm active.

发生E.G.A.错误时, 燃烧器运行, 警报响起

14 0

**Unused.**

未使用

15 3

**User Control:** This sets whether the user can change the setpoint and enable/disable the burner.

**用户控制:** 该选项决定用户能否更改设定点和启停燃烧器。

0 Burner on/off and setpoint control disabled.

关闭用户对燃烧器启停和设定点的控制。

1 Burner on/off disabled and setpoint control enabled.

关闭用户对燃烧器启停的控制, 但允许用户控制设定点。

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		2	Burner on/off enabled and setpoint control disabled. 允许用户控制燃烧器启停，但是关闭设定点控制。
		3	Burner on/off and setpoint control enabled. 允许用户控制燃烧器，允许用户控制设定点
16	0		<b>Sequencing and D.T.I Enable:</b> A lead boiler can be selected by press Lead Boiler in the IBS screen or via the D.T.I. if optioned. Only 1 M.M. may be selected as lead boiler at a time, or the sequencing will not operate. The Lead Boiler button on the M.M. overrides the D.T.I. Lead Boiler Select. <b>排序和DTI:</b> 在锅炉智能排序界面（IBS）选择领头锅炉或者通过D.T.I.远程选择领头锅炉。每次只有一个控制模块（锅炉）能被选为领头锅炉，否则排序无法进行。本地控制模块的领头锅炉按钮要优先于D.T.I.远程选择的领头锅炉。
		0	Sequencing disabled. 关闭排序
		1	Sequencing enabled. 开启排序
		2	D.T.I. enabled. 开启D.T.I.
		3	Sequencing and D.T.I. 开启排序和D.T.I.
			<b>Note:</b> Accurate fuel flow metering must be entered for sequencing of different burner ratings, as fuel flow metering high fire point sets the burner rating. <b>注意:</b> 必须安装准确的燃料流量表来实现不同规格的燃烧器排序。燃料流量表的大火位与燃烧器规格对应。
17	0		<b>Unused.</b> 未使用
18	1		<b>Carry Forward of Trim:</b> When the system modulates, the correction that may already exist on the air damper position can be carried forward. This option is only relevant if an E.G.A. is operational on the system. Trim will be reset if the rate of change of the fuel valve angle is greater than that set in parameter 14. <b>EGA调节值的延续:</b> 当系统进行控制时，已有的空气挡板调节值将得以延续。该选项只在E.G.A.运行时才有效。当燃料阀门角度变化速率大于参数14的数值时，空气挡板调节值将被重置。
		0	Disabled. 关闭选项
		1	Enabled. 启用选项
19	0		<b>O2 Upper Limit Offset:</b> This is an offset limit from the commissioned values. Options 19 - 27 are only relevant if an E.G.A. is operational on the system. Option 12 must be set to 3. <b>氧气上限补偿值:</b> 这是调试值的补偿值极限。选项19 – 27 只在E.G.A.处于运行时才有效。选项12的数值必须是3。
		0	Disabled. 关闭选项
		0.1 - 10.0	% O2 氧气百分比
20	0		<b>CO2 Upper Limit Offset:</b> This is an offset limit from the commissioned values. <b>二氧化碳上限补偿值:</b> 这是调试值的补偿值极限。
		0	Disabled. 关闭选项
		0.1 - 10.0	% CO2 二氧化碳百分比
21	0		<b>CO Upper Limit Offset:</b> This is an offset limit from the commissioned values. <b>一氧化碳上限补偿值:</b> 这是调试值的补偿值极限。
		0	Disabled. 关闭选项
		1 - 200	ppm CO 一氧化碳百万分率
22	0		<b>O2 Lower Limit Offset:</b> This is an offset limit from the commissioned values. <b>氧气下限补偿值:</b> 这是调试值的补偿值极限。
		0	Disabled

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			关闭选项
23	0	0.1- 10.0	% O <sub>2</sub> 氧气百分比 <b>CO<sub>2</sub> Lower Limit Offset:</b> This is an offset limit from the commissioned values. <b>二氧化碳下限补偿值:</b> 这是调试值的补偿值极限。
		0	Disabled. 关闭选项
24	0	0.1-10.0	% CO <sub>2</sub> 二氧化碳百分比 <b>Unused.</b> 未使用
25	0	0.1-20.0	<b>O<sub>2</sub> Absolute Limit:</b> System checks for O <sub>2</sub> values lower than the value specified in this option regardless of the commissioned values. <b>氧气绝对值:</b> 系统检查氧气数值是否低于本选项数值。这与调试数值无关。 0 Disabled. 关闭选项
26	0.0	0.1-20.0	<b>CO<sub>2</sub> Absolute Limit:</b> System checks for CO <sub>2</sub> values higher than the value specified in this option regardless of the commissioned values. <b>二氧化碳绝对值:</b> 系统检查二氧化碳数值是否高于本选项数值。这与调试数值无关。 0 Disabled. 关闭选项
27	0	0.1-20.0	<b>CO Absolute Limit:</b> System checks for CO readings higher than value specified in this option regardless of the commissioned values. <b>一氧化碳绝对数值:</b> 系统检查一氧化碳数值是否高于本选项数值。这与调试数值无关。 0 Disabled. 关闭选项
28	20	1 - 200	<b>Trim Threshold:</b> This option is only relevant if an E.G.A. is operational on the system. The value set in this option is subtracted from the required setpoint. If the actual value is below this offset, then the E.G.A. will not trim. If the trim is to be effective at all times, then set this value to zero. This Option must also be set to zero for the E.G.A. to operate when external modulation is optioned. <b>EGA调节阈值:</b> 本选项只在E.G.A.运行时有效。设定点将减去本选项数值。如果实际数值低于补偿值，E.G.A.将不执行调节。如果本选项为0，E.G.A.将始终进行调节。当系统采用外部调节时本选项数值必须为0来保证E.G.A.始终执行调节。 0 - 50 If Centigrade, Fahrenheit or PSI units effective. 使用单位是摄氏，华氏或者磅/平方英寸
		0 - 5.0	If Bar units effective. 使用单位是巴
29	0	0	<b>Golden Start:</b> See Section 3.4.7. Parameter 15 sets the time golden start is maintained after ignition. <b>黄金启动:</b> 参见章节3.4.7.。参数15设置点火后黄金启动的时长。
		1	Enabled. 开启选项
30	50	5 - 9990	<b>Minimum Remote Setpoint (D.T.I./Modbus):</b> If the system is being used with a D.T.I. maximum and minimum limits for the required setpoint must be set. If a value is received from the D.T.I. that is outside of these limits, it will coerced into this range. Practical range is limited to the range of sensor selected. <b>最低远程设定值(D.T.I./Modbus):</b> 当系统使用D.T.I.时一定要设置设定点的最高极限和最低极限。当系统收到的D.T.I.数据超出了极限值范围，系统会自动遵从这个范围。实际范围受到所选感应器测量范围的限制。 5 - 9990 If Centigrade, Fahrenheit or PSI units effective. 使用单位是摄氏，华氏或者磅/平方英寸
		0.5-999.0	If Bar units effective. 使用单位是巴

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31	100	<b>Maximum Remote Setpoint (D.T.I./ Modbus):</b> <b>最高远程设定值(D.T.I./ Modbus):</b> 5 - 9990 If Centigrade, Fahrenheit or PSI units effective. 使用单位是摄氏, 华氏或者磅/平方英寸 0.5- 999.0 If Bar units effective. 使用单位是巴
32	20	<b>Trim Delay:</b> After ignition, the E.G.A. does not sample for the period of time set in this option (only relevant if E.G.A. is operational on system). This allows for the combustion to stabilise before sampling commences. The timing starts at the ignition point. <b>EGA调节延时:</b> 点火后E.G.A.在本选项时长内不执行取样（仅在E.G.A.运行时有效）。这是为了获得稳定的燃烧状态样本。计时始于点燃油点。 0 - 250 Period (seconds) after ignition where no sampling takes place. 延时取样的时间段。
33	1	<b>M.M. Identification:</b> Each M.M. within a sequence loop must have an individual ID. Communication problems will occur within an IBS loop if incorrect or same IDs are set for the M.M.s <b>控制模块标识:</b> 锅炉排序的每台锅炉控制模块都有一个标识号。控制模块标识错误会导致锅炉排序的通讯问题。 1 - 10 Identification number 锅炉标识号
34	0	<b>Unused.</b> 未使用
35	10	<b>Sequence Scan Time:</b> This is the time period between sequencing requests from the lead M.M. On the sequence scan time, the lead M.M. will demand lag burners to be brought online or offline, depending on load requirements. See Parameters 86 and 87 for change down and up thresholds. <b>排序扫描时间:</b> 这是领头控制模块先后发出两次排序指令的间隔。在排序扫描时间内领头控制模块会根据荷载情况来命令滞后锅炉的上线运行或者下线待机。参见参数86和87来降低和升高阈值。 1 - 100 Sequence scan time (minutes). 排序扫描时间（分钟） <b>Note:</b> Accurate fuel flow metering must be entered for sequencing to operate. An data cable (Beldon 501) must be connected between each M.M. unit (see sections 1.5 and 1.6 for correct connection). <b>注意:</b> 排序操作需要安装准确的燃料流量表。各控制模块必须用数据线(Beldon 501)连接（关于正确连接请参见章节1.5和1.6）
36	0	<b>Sensor Selection (Mk7 E.G.A. only):</b> Available when using an E.G.A. System fitted with NO2 and SO2 cells. The following option selects the type of additional cells used. <b>感应器选择（只用于Mk7 E.G.A.）:</b> 该选项只在E.G.A.系统配有NO2 and SO2传感器时有效。该选项选择额外使用的感应器类型。 0 No optional sensor. 无额外感应器 1 NO2 only. 仅NO2感应器 2 SO2 only. 仅SO2感应器 3 NO2 and SO2. NO2 and SO2
37	0	<b>Derivative Time:</b> The time taken to add/ remove additional 10% to the firing rate based on the actual value and the required value. <b>微分时间:</b> 根据实际值和需求值的相对关系来添加或者减少10%燃烧率所需要的时间。 0 Disabled 关闭选项 1- 200 Seconds. 秒
38	2	<b>Derivative Deadband:</b> This the deadband is the margin above and below the required setpoint in which no derivative control occurs. <b>微分静带:</b> 微分静带是处于设定点上方和下方的规定区域。在这个区域不发生燃烧率的添加和减少。 0 - 15 If Centigrade, Fahrenheit or PSI units effective. 使用单位是摄氏, 华氏或者磅/平方英寸 0 - 1.5 If Bar units effective.

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		使用单位是巴
39	0	<b>Unused.</b> 未使用
40	0	<b>Warming Facility for Low Pressure Steam:</b> For sequencing applications where non-return valves are not installed, it is not possible to use a setpoint to keep the boilers in a standby condition. A thermostat (aquastat) can be installed into the boiler shell. Set Option/ parameter 156 to 0 to enable Terminal 82 for Warming Stat. When Terminal 82 sees a 230V/ 120V input, warming is stopped. The boiler will remain in a warming state based on the settings in Options 53 and 54. <b>低压蒸汽的加热设备：</b> 无止回阀的锅炉排序无法用设定点来实现锅炉待机。这时炉筒上应安装温控器，还要将选项/参数156设置为0（这是为了使用终端82的加热温控设备）。当终端82收到一个230V/ 120V信号输入，加热停止。根据选项53和54的数值来加热锅炉。
	0	Steam sequencing with non-return valves. 有止回阀的蒸汽锅炉排序
	1	Steam sequencing without non-return valves. 无止回阀的蒸汽锅炉排序
41	0	<b>Warming Mode:</b> This option sets 2 states of operation for the lag boilers. Either the first lag is kept in a standby state with the second lag kept in a warming state and the other boilers are off, or all the lag boilers after the first are kept in a warming state and there are no boilers offline. <b>加热模式：</b> 这个选项设定滞后锅炉的两种运行状态。 <b>第一种</b> 是第一滞后锅炉保持待机状态，第二滞后锅炉保持加热并且其他锅炉处于关闭。 <b>第二种</b> 是所有滞后锅炉保持加热状态。
	0	One M.M. in warming state. 一个控制模块处于加热状态。
	1	All unused M.M.s in warming state. 所有滞后控制模块处于加热状态。
42	20	<b>Standby Setpoint:</b> For sequencing applications where non-return valves are installed, the first lag boiler uses a standby setpoint to keep the boiler in a standby condition. This value is an absolute value set in this option. When the standby setpoint is in effect, the burner is held at low flame hold <b>待机设定点：</b> 当排序锅炉带有止回阀时，第一滞后锅炉将用待机设定点来保持锅炉待机。本选项将设定这个设定点绝对值，燃烧器在待机时保持低火焰燃烧。
43	0	<b>Unused.</b> 未使用
44	0	<b>Unused.</b> 未使用
45	0	<b>External Modulation:</b> When enabled, the internal PID control is disabled and the firing rate is set by an external controller applied to the appropriate input Terminals 37,38. This input control signal can be 0 - 10V or 2 - 10V set through parameter 69, and represent low to high fire and zero to high by setting parameter 68. A manual reset high limit stat must be fitted. <b>外部调试：</b> 在使用外部控制时内部PID控制将关闭，外部控制器向终端37, 38输入信号来设定燃烧率。控制信号可以是0 - 10V 或者 2 - 10V（这可以通过参数69来设定）。参数68可以设定从低火到高火的控制信号或者从零火到高火的控制信号。必须安装用于重置高火限制值的手动控制。 The required setpoint and pressure/ temperature is not displayed on the M.M. 控制模块屏幕不显示所需的设定点和压力/温度。
	0	Disabled. 选项关闭
	1	Enabled. 选项启用
		<b>Note:</b> External modulation will work with or without fuel flow commissioning set. <b>注意：</b> 外部控制可以被单独使用也可以与燃料流量调试设备一起使用。
46	0	<b>Unused.</b> 未使用
47	0	<b>Cold Start Routine:</b> On burner start-up, if the actual value is at 30% or below of the required setpoint, then the burner will be held at low fire for the number of minutes set in this option. It will then go to mid-fire. If the actual value below 60% of the required setpoint, then the burner will be held at mid-fire for the set minutes. Once this cold start time has elapsed, or the value goes above 60% of the required, the burner will go to high fire as per the internal PID. <b>冷启动程序：</b> 当燃烧器启动时如果实际值是设定值的30%或者更低，燃烧器将保持低火燃烧，时长是本选项规定的分钟数；然后进入中火燃烧，如果实际值

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			是设定值的60%或者更低，燃烧器将保持中火燃烧，时长是本选项规定的分钟数；一旦冷启动程序完成，燃烧器将按照内部PID控制进入高火燃烧。
	0	Disabled. 选项关闭	
	1 - 2000	Number of minutes for cold start operation. 冷启动的分钟数	<b>Note:</b> It is not recommended to use cold start routine with sequencing or external modulation.
48	0		<b>注意:</b> 在使用锅炉排序或者外部控制时不建议使用冷启动程序。 <b>Flue Gas Recirculation - Timer:</b> This is the time that the M.M. channels (servomotors/ variable speed drives) are held at the FGR start positions, after which modulation then takes place. This timer starts at the end of main flame proving. See section 3.4.8.
	0	Disabled. 选项关闭	<b>烟气再循环 – 计时器:</b> 这是将控制模块频道（伺服马达/变速驱动）保持在烟气再循环开始位的时长，完成这个步骤后系统将进入控制。计时器从完成主火焰校验后开始计时。
	1 - 600	Seconds. 秒数	
49	0		<b>Flue Gas Recirculation - Offset:</b> This is an offset from the required setpoint. The M.M. channels (servomotors/variable speed drive) are held at the FGR start positions until the actual value reaches the offset value below the required setpoint.
	0	Disabled. 选项关闭	<b>烟气再循环 – 补偿值:</b> 这是设定值的补偿值。控制模块频道（伺服马达/变速驱动）将一直停留在烟气再循环开始位，直到实际值达到设定值之下的补偿值。
	1 - 50	If Centigrade, Fahrenheit or PSI units effective. 使用单位是摄氏，华氏或者磅/平方英寸	
	0.1 - 5.0	If Bar units effective. 使用单位是巴	
50	0		<b>Flue Gas Recirculation - Temperature Threshold:</b> The M.M. channels (servomotors/ variable speed drive) are held at the FGR start positions until the flue gas temperature has reached 120 degC 248 degF. (An E.G.A. must be present and optioned).
	0	FGR temperature threshold disabled. 关闭烟气再循环温度阈值	<b>烟气再循环 – 温度阈值:</b> 控制模块频道（伺服马达/变速驱动）将一直停留在烟气再循环的开始位置，直到烟气温度达到120摄氏度248华氏度（系统必须配有E.G.A.）
	1	FGR temperature threshold enabled. 启用烟气再循环温度阈值	
51	0	<b>Unused.</b> 未使用	
52	0	<b>Unused.</b> 未使用	
53	0		<b>Steam Sequencing Burner Off Time:</b> When the M.M. is in Warming mode, it will warm to the standby setpoint according to the on and off times set in options 53 and 54.
	0	<b>Off</b> 选项关闭	<b>蒸汽锅炉排序的燃烧器停止时间:</b> 当控制模块处于加温模式，燃烧器根据选项53和54的开启和停止时间将锅炉加热到待机设定点。
	1 - 200	Number of minutes burner is 'off' in warming mode. 加温模式下燃烧器“停止”分钟数	
54	5		<b>Steam Sequencing Burner On Time:</b> When the M.M. is in Warming mode, it will warm to the standby setpoint according to the on and off times set in options 53 and 54.
	0	<b>Off</b> 选项关闭	<b>蒸汽锅炉排序的燃烧器开启时间:</b> 当控制模块处于加温模式，燃烧器根据选项53和54的开启和停止时间将锅炉加热到待机设定点。
	1 - 200	Number of minutes burner is 'on' in warming mode. 加温模式下燃烧器“开启”分钟数	
55	0	<b>Unused.</b> 未使用	

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56	0	<b>Alarm Output Operation (Terminal #79)</b> 警报输出操作（终端 #79）
	0	Relay normally off, on when alarm. 继电器常闭，继电器打开时输出警报
	1	Relay normally on, off when alarm. 继电器常开，继电器关闭时输出警报
		<b>Note:</b> This is a switched neutral output terminal. <b>注意：</b> 这是一个切换至中性位的终端。
57	0	<b>Fuel Flow Metering:</b> Autoflame recommend entering 'dummy points' if a fuel meter is not available to measure the actual flow. Setting this option to 1 will initiate fuel flow metering once the burner is firing. <b>燃料流量计量：</b> 当未使用燃料流量表时Autoflame建议设定“虚拟点”。当本选项为1时，当燃烧器开始燃烧时燃料流量表将开始计量。
	0	Disabled. 选项关闭
	1	Enabled. 选项开启
58	15	<b>Fuel flow Metering Ignition Delay:</b> Delay after ignition until fuel flow metering begins. <b>点火后燃料表的计量延迟：</b> 点火后燃料表的延迟计量。
	0 - 240	Seconds 秒
59	0	<b>Unused.</b> 未使用
60	0	<b>Unused.</b> 未使用
61	3725	<b>Fuel 1 Calorific Value:</b> Set option 65 to either Metric or Imperial units. <b>燃料1热值：</b> 将选项65设置为公制或者英制单位。 100 - 65000 100 = 1.00 MJ/m³ or 100 Btu/ft³.
		<b>Note:</b> If switching from metric to imperial the value will need to be changed accordingly. <b>注意：</b> 当单位从公制转为英制时，数值要相应转换。
62	2068	<b>Fuel 2 Calorific Value:</b> See option 65 to either Metric or Imperial units. <b>燃料2热值：</b> 将选项65设置为公制或者英制单位。 100 - 65000 100 = 1.00 MJ/m³ or 100 Btu/ft³.
		<b>Note:</b> If switching from metric to imperial the value will need to be changed accordingly. <b>注意：</b> 当单位从公制转为英制时，数值要相应转换。
63	0	<b>Unused.</b> 未使用
64	0	<b>Unused.</b> 未使用
65	0	<b>Display Units:</b> 单位
	0	Metric units. 公制单位
	1	Imperial units. 英制单位
66	0	<b>Firing Rate Limit:</b> This is the maximum firing rate that can be attained by the system, imposed both Auto and Hand modes. <b>燃烧率极限：</b> 这是在自动和手动模式下系统能够达到的最高燃烧率。
	0	Disabled. 选项关闭
	1 - 100	Maximum firing rate permitted (%). 允许的最高燃烧率(%)。
		<b>Note:</b> Firing Rate Limit is not to be used with D.T.I. load index control, external modulation or sequencing. <b>注意：</b> 当使用D.T.I.荷载控制，外部控制或者锅炉排序时不使用燃烧率极限。
67	1	<b>Channel 1 Purge Position:</b> 频道1吹扫位

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		0	Channel 1 to purge position. 频道1吹扫
		1	Channel 1 to remain closed for purge. 频道1保持关闭
68	0	<b>Channel 2 Purge Position:</b> <b>频道2吹扫位</b>	
		0	Channel 2 to purge position. 频道2吹扫
		1	Channel 2 to remain closed for purge. 频道2保持关闭
69	0	<b>Channel 3 Purge Position:</b> <b>频道3吹扫位</b>	
		0	Channel 3 to purge position. 频道3吹扫
		1	Channel 3 to remain closed for purge. 频道3保持关闭
70	0	<b>Unused.</b> 未使用	
71	0	<b>Unused.</b> 未使用	
72	0	<b>Unused.</b> 未使用	
73	0	<b>Unused.</b> 未使用	
74	0	<b>Unused.</b> 未使用	
75	100	<b>Purge Motor Travel Speed:</b> <b>吹扫马达转动速度</b>	
		10 - 100	Degrees per second. 每秒角度
76	0	<b>Unused.</b> 未使用	
77	0	<b>Unused</b>	
78	0	<b>Unused.</b> 未使用	
79	0	<b>Unused.</b> 未使用	
80	0	<b>Outside Temperature Compensation:</b> <b>室外温度补偿</b>	
		0	Disabled. 选项关闭
		1	Enabled. 选项开启
81	90	<b>Setpoint at Minimum Outside Temperature:</b> <b>在最低室外温度时的设定点</b>	
		50 - 999	If Centigrade, Fahrenheit or PSI units effective. 使用单位是摄氏，华氏或者磅/平方英寸
		5.0- 99.9	If Bar units effective. 使用单位是巴
		<i>Note: Range is limited in accordance with the sensor selected in Option 1.</i> <i>注意：本选项数值范围受到选项1所选感应器的限制。</i>	
82	30	<b>Minimum outside temperature:</b> <b>最低室外温度</b>	
		0 - 145	Value of 30 = -10 degF or - 10 deg C 数值30 = -10 degF or - 10 deg C
83	80	<b>Setpoint at Maximum Outside Temperature:</b> <b>在最高室外温度时的设定点</b>	
		50 - 999	If Centigrade, Fahrenheit or PSI units effective. 使用单位是摄氏，华氏或者磅/平方英寸
		5.0- 99.9	If Bar units effective. 使用单位是巴
		<i>Note: Range is limited in accordance with the sensor selected in Option 1.</i> <i>注意：本选项数值范围受到选项1所选感应器的限制。</i>	
84	80	<b>Maximum Outside Temperature:</b>	

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		<b>最高室外温度</b>
85	0	<p>0 - 145 Value of 80 = 40 degF or 40 deg C 数值80 = 40 degF or 40 deg C</p> <p><b>Night Setback Offset:</b> This offset is subtracted from the normal required setpoint. An input is required on Terminal 80, please set option/parameter 154 to night setback input.</p> <p><b>夜间调低补偿:</b> 这是正常设定点减去的补偿值。由于终端80需要信号输入, 请将选项/参数154设置为夜间调低补偿值输入。</p>
		<p>0 - 100 If Centigrade, Fahrenheit or PSI units effective. 使用单位是摄氏, 华氏或者磅/平方英寸</p> <p>0.0- 10.0 If Bar units effective. 使用单位是巴</p>
86	0	<p><b>Channel 1 Servomotor Control Method:</b> <b>频道1伺服马达控制方法</b></p> <p>0 Autoflame servomotor, 0.1 degree control. Autoflame伺服马达, 0.1角度控制</p> <p>1 Autoflame servomotor, 0.5 degree control. Autoflame伺服马达, 0.5角度控制</p> <p>2 Industrial servomotor, 0.1 degree control. 工业伺服马达, 0.1角度控制</p> <p>3 Industrial servomotor, 0.5 degree control. 工业伺服马达, 0.5角度控制</p>
87	0	<p><b>Channel 2 Servomotor Control Method:</b> <b>频道2伺服马达控制方法</b></p> <p>0 Autoflame servomotor, 0.1 degree control. Autoflame伺服马达, 0.1角度控制</p> <p>1 Autoflame servomotor, 0.5 degree control. Autoflame伺服马达, 0.5角度控制</p> <p>2 Industrial servomotor, 0.1 degree control. 工业伺服马达, 0.1角度控制</p> <p>3 Industrial servomotor, 0.5 degree control. 工业伺服马达, 0.5角度控制</p>
88	0	<p><b>Channel 3 softened error checking select:</b> <b>频道3 软错误检查的选择:</b></p> <p>0 Autoflame servomotor, 0.1 degree control. Autoflame伺服马达, 0.1角度控制</p> <p>1 Autoflame servomotor, 0.5 degree control. Autoflame伺服马达, 0.5角度控制</p> <p>2 Industrial servomotor, 0.1 degree control. 工业伺服马达, 0.1角度控制</p> <p>3 Industrial servomotor, 0.5 degree control. 工业伺服马达, 0.5角度控制</p>
89	0	<b>Unused.</b> 未使用
90	0	<p><b>VSD operation channel 4:</b> <b>变速驱动频道4:</b></p> <p>0 Disabled. 选项关闭</p> <p>1 Enabled. 选项开启</p>
91	0	<p><b>Output from M.M. to VSD channel 4:</b> <b>控制模块到变速驱动频道4的信号输入:</b></p> <p>0 Output range 4 - 20mA. 信号输入范围4 - 20mA</p> <p>1 Output range 0 - 20mA. 信号输入范围0 - 20mA</p> <p>2 Output range 0 - 10V. 信号输入范围0 - 10V</p>
92	0	<p><b>Output units displayed, VSD channel 4:</b> <b>变速驱动频道4输出信号的单位:</b></p> <p>0 Selected output signal. 所选择的输出信号</p> <p>1 Hertz. 赫兹</p>
93	25	<b>Output low speed from M.M. to VSD channel 4:</b>

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			从控制模块到变速驱动器频道4的低速输入信号
		1 - 200	Hertz 赫兹
94	50		<b>Output high speed from M.M. to VSD channel 4:</b> 从控制模块到变速驱动器频道4的高速输入信号
		1 - 200	Hertz. 赫兹
95	0		<b>Input signal to M.M. from VSD channel 4:</b> 从变速驱动器频道4到控制模块的输入信号
	0		0 Input range to 4 - 20mA. 信号输入范围4 - 20mA
		1	1 Input range to 0 - 20mA. 信号输入范围0 - 20mA
		2	2 Input range to 0 - 10V. 信号输入范围0 - 10V
96	0		<b>Input units displayed, VSD channel 4:</b> 变速驱动频道4输入信号的单位
	0		0 Selected output signal. 所选择的输出信号
		1	1 Hertz. 赫兹
97	50		<b>Input low speed to M.M. from VSD channel 4:</b> 从变速驱动器频道4到控制模块的低速输入信号
		0 - 200	Hertz. 赫兹
98	0		<b>Input high speed to M.M. from VSD channel 4:</b> 从变速驱动器频道4到控制模块的高速输入信号
		0 - 200	Hertz. 赫兹
99	0		<b>Unused.</b> 未使用
100	0		<b>Sequencing/ D.T.I. or Modbus operation:</b> 排序/D.T.I.或者Modbus操作:
	0		0 M.M./ D.T.I. Sequencing 控制模块/ D.T.I.排序
		1	1 Modbus. <b>Modbus操作</b>
101	0		<b>Modbus baud rate:</b> <b>Modbus波特率</b>
		0	0 9600 baud. 9600波特
		1	1 19200 baud. 19200波特
102	0		<b>Modbus parity setting:</b> <b>Modbus奇偶设置</b>
		0	0 No parity. 无奇偶设置
		1	1 Odd parity. 奇数校验
		2	2 Even parity. 偶数校验
103	1		<b>Modbus stop bits setting:</b> <b>Modbus停止位设置</b>
		1	1 1 stop bit. 1停止位
		2	2 2 stop bits. 2停止位
104	1		<b>Modbus device ID:</b> <b>Modbus设备标识</b>
		1 - 247	ID range. 标识范围
105	0		<b>Modbus data format:</b> <b>Modbus数据格式</b>
	0		0 Binary format. 二进格式

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	1	ASCII format. ACSI格式
106	0	<b>Unused.</b> 未使用
107	0	<b>Unused.</b> 未使用
108	0	<b>Unused.</b> 未使用
109	0	<b>Unused.</b> 未使用
<p><b>For safety reasons, Options, 110 - 160 also have to be entered in as Parameters. It is the responsibility of the commissioning engineer to ensure that all settings are set in accordance with the appropriate standards, local codes and practices. If the M.M. system is stuck in the 'idle' condition, it is likely that options 110 - 160 are not identical to Parameters 110 - 160. If the commissioning mode is entered, the relevant Options/ Parameters not set correctly will be displayed on the commissioning mode screen.</b></p> <p>出于安全考虑，选项110 – 160的数值要与参数110 – 160的数值一致。调试工程师要确保所有设置数值符合各项标准，当地法规和规范的要求。如果控制模块被卡在“闲置模式”，原因可能是选项110 – 160的数值和参数110 – 160的数值不一致。在调试模式下，所有错误的选项/参数设置将被显示在调试屏幕上。</p>		
110	1	<b>UV Flame scanner type:</b> 紫外线火焰扫描仪类型: 1 Standard scanner. 标准扫描仪 2 Self-check scanner. 自检扫描仪
111	0	<b>Interrupted Pilot:</b> 中断式导燃 0 Interrupted pilot. 中断式导燃 1 Intermittent pilot. 间歇式导燃 2 No pilot. 无导燃
		<b>Note:</b> No pilot cannot be used with single valve pilot (option 133) or switchover flame scanner (option 122).
		<b>注意:</b> 在使用单阀导燃（选项133）或者切换型火焰扫描仪（选项122）时不能使用无导燃选项。
112	40	<b>Pre-purge time:</b> 前吹扫时间 5 - 240 Seconds/minutes - see Option 135. 秒/分钟 – 见选项135
113	3	<b>Pre-ignition time:</b> The period when the ignition transformer is on before the pilot gas valve opens. 先期点火时间：在导燃燃气阀开启前点火变压器运行的时间。 3 - 5 Seconds. 秒
114	3	<b>First safety time:</b> The period when the pilot valve is open before the UV is checked. 第一安全时间：在检查紫外线完成前导燃阀保持开启的时间。 3 - 10 Seconds. 秒
115	3	<b>Pilot prove time - pilot trial for ignition (PTFI):</b> 引导校验时间 – 点火前的引导测试(PTFI): 3 - 5 Seconds. 秒
116	3	<b>Fuel 1 second safety time - main trial for ignition (MTFI):</b> The period when the pilot/main valve overlap (this does not apply to intermittent pilot). 燃料1第二安全时间 – 点火前的主测试 (MTFI): 导向阀和主阀运行相重叠的时间段（这不适用于间歇式导燃） 3 - 15 Seconds. 秒 <b>Note:</b> This is a maximum of 10 seconds if fuel 1 is set to gas, see option 150.

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			<b>注意:</b> 如果燃料1被设置为燃气, 该选项的最大值应为10秒, 参见选项150。
117	5		<b>Main flame proving time:</b> The period from when the main valves open to the burner modulating. <b>主要火焰校验时间:</b> 从主阀门开启到开始燃烧器控制的时间。 Seconds. 秒
118	0	5 - 20	<b>Post-purge time:</b> This time should allow for the servomotors to travel from low fire to purge positions. <b>后吹扫时间:</b> 伺服马达从低火到吹扫的运行时间。 0 无后吹扫 1 - 100 Seconds/Minutes. 秒/分钟 <b>Note:</b> UV not checked during post purge. See also Option 135. <b>注意:</b> 在后吹扫期间不检查紫外线, 见选项135
119	10	3 - 120	<b>Control box recycle time:</b> Time delay from burner shut down to startup. <b>控制盒循环时间:</b> 从燃烧器关闭到启动的延时 Seconds. 秒
120	10		<b>UV Threshold:</b> <b>紫外线阈值:</b> 1 - 50 Minimum flame signal strength during pilot. (All other times UV threshold is fixed at 5) 导燃阶段的最低火焰信号强度。(在其他时段紫外线阈值为5, 固定不变)
121	5	5 - 10	<b>Delay from start of pre-purge until air switch checked:</b> <b>从开启前吹扫到空气开关检查的延时</b> Seconds. 秒
122	0		<b>Flame sensor operation:</b> <b>火焰感应器的运行</b> 0 UV 紫外线 2 Ionisation 电离感应 4 IR 红外线 5 IR and UV 红外线和紫外线 6 IR and Ionisation 红外线和电离感应 7 Ionisation to UV Switchover 电离感应和紫外线切换 <b>Note:</b> Ionisation to UV Switchover is intended for Interrupted Pilot (it cannot be used with no pilot). <b>注意:</b> 电离感应和紫外线切换应用于中断式导燃(不能用于无导燃)
123	3	3 - 15	<b>Fuel 2 second safety time - main trial for ignition (MTFI):</b> The period when the pilot/main valve overlap (this does not apply to intermittent pilot). <b>燃料2第二安全时间 - 点火主测试(MTFI):</b> 导阀和主阀同时运行的时段(不适用于间歇式导燃) Seconds. 秒 <b>Note:</b> This is a maximum of 10 seconds if fuel 2 is set to gas, see option 151. <b>注意:</b> 如果燃料2被设为燃气, 该选项的最大值应为10秒, 参见选项151。
124	0		<b>Unused.</b> 未使用
125	0		<b>Fuel Pressure Sensor Mode - Fuel 1:</b> <b>燃料压力感应器模式 - 燃料1</b> 0 Not checked. 不检查 1 Pressure limits, valve proving (see Options 136/ 137). 压力极限值, 阀门校验(参见选项136/137) 2 Pressure limits (see Options 136/ 137) 压力极限值(参见选项136/137) 3 External VPS optioned. If external VPS is set then the system will wait for a mains voltage input on Terminal 55 to confirm that the external VPS operation is

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			completed. If a voltage is not seen on Terminal 55 within 10 minutes, a lockout will occur. 启用外部VPS（阀门校验系统）。在使用外部VPS时，系统要等待终端55收到干线电压来确认外部VPS运行已完成。若10分钟内终端55未收到电压信号，系统将锁定。
126	0		<b>Fuel Pressure Sensor Mode - Fuel 2:</b> <b>燃料压力感应器模式 – 燃料2</b>
	0		Not checked. 不检查
	1		Pressure limits, valve proving (see Options 136/ 137). 压力极限值，阀门校验（参见选项136/137）
	2		Pressure limits (see Options 136/ 137) 压力极限值（参加选项136/137）
	3		External VPS optioned. If external VPS is set then the system will wait for a mains voltage input on Terminal 55 to confirm that the external VPS operation is completed. If a voltage is not seen on Terminal 55 within 10 minutes, a lockout will occur. 启用外部VPS（阀门校验系统）。在使用外部VPS时，系统需要等待终端55收到干线电压来确认外部VPS运行已完成。当10分钟内终端55未收到电压信号，系统将锁定。
127	0		<b>Unused.</b> <b>未使用</b>
128	0		<b>VPS Sensor Type:</b> <b>VPS（阀门校验系统）感应器类型</b>
	0		Mains input. 干线电压输入
	1		Pressure sensor. 压力感应器
129	0		<b>VPS Operation:</b> <b>VPS（阀门校验系统）运行</b>
	0		VPS operates before burner start up. VPS在燃烧器启动前运行
	1		VPS operates after burner shutdown. VPS在燃烧器关闭后运行
	2		VPS operates before burner startup and after burner shutdown. VPS在燃烧器启动前和关闭后运行
130	2		<b>Gas valve configuration:</b> <b>燃气阀门结构</b>
	0		No vent valve. 无排气阀
	1		Vent valve normally closed. 排气阀常闭
	2		Vent valve normally open. 排气阀常开
	3		No vent valve. Single valve pilot. 无排气阀。单阀导燃。
	4		Vent valve normally closed. Single valve pilot. 排气阀常闭。单阀导燃。
	5		Vent valve noramlly open. Single valve pilot. 排气阀常开。单阀导燃。
			<b>Note:</b> Single valve pilot cannot be used with no pilot (see option/ parameter 111). <b>注意：</b> 单阀导燃不适用于无导燃情况。（参见选项/参数111）
131	0		<b>Gas pressure units:</b> PSI not available for MM80006 <b>燃气压力单位：</b> MM80006不采用PSI单位
	0		"wg. mbar.
	2		PSI.
132	20		<b>Gas valve proving time:</b> <b>燃气阀校验时间</b>
	10 - 300		Seconds. 秒
133	5.1		<b>Maximum pressure change allowed during proving time:</b> <b>校验时间内允许的最大压力变化</b>
	0.1 - 5		"wg/ 0.2 - 12.4 mBar/ PSI not available (Sensor MM80006) "wg/ 0.2 - 12.4 mBar/ 不采用PSI (感应器 MM80006)

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		0.4 - "wg/ 1.1 - 63mBar/ 0.02 - 0.91 PSI (Sensor MM80008) 25.2 "wg/ 1.1 - 63mBar/ 0.02 - 0.91 PSI (感应器 MM80008) 1 - 56 "wg/ 2.5 - 140mBar/ 0.04 - 2.03 PSI (Sensor MM80011) "wg/ 2.5 - 140mBar/ 0.04 - 2.03 PSI (感应器 MM80011) 1.9 - 103 "wg/ 4.6 - 356 mBar/ 0.07 - 5.16 PSI (Sensor MM80012) "wg/ 4.6 - 356 mBar/ 0.07 - 5.16 PSI (感应器 MM80012) 5.6 - 307 "wg/ 13.9 - 765mBar/ 0.20 - 11.09 PSI (Sensor MM80014) "wg/ 13.9 - 765mBar/ 0.20 - 11.09 PSI (感应器 MM80014)
		<b>Note:</b> Only the Mk8 Gas/ Air Pressure Sensors can be used with the Mini Mk8 M.M. <b>注意:</b> Mk8微型控制模块只使用Mk8燃气/空气压力感应器
134	5	<b>VPS valve opening time:</b> <b>VPS</b> (阀门校验系统) 阀门开启时间 3 - 20 Seconds. 秒
135	0	<b>Purge time units/ NFPA Post-purge:</b> <b>吹扫时间单位/ NFPA (国家消防协会) 后吹扫</b> 0 Purge time in seconds. 吹扫时间以秒计 1 Purge time in minutes. 吹扫时间以分钟计 2 NFPA post purge in seconds. NFPA后吹扫以秒计 3 NFPA post purge in minutes. NFPA后吹扫以分钟计 <b>Note:</b> If this Option is set to 2 (NFPA post purge) then Option 118 must be set to a value of 15 or greater otherwise a lockout warning message will occur. During the NFPA post purge the servomotors will remain at the position that they were in before a normal shutdown or lockout (see also Option 67 to 70). The NFPA post purge will occur under any normal shutdown or lockout at any point in firing. <b>注意:</b> 如果本选项为2 (NFPA后吹扫) 那么选项118必须设为15或者更大值，否则会出现锁定警告信息。在NFPA后吹扫期间的伺服马达将保持它们在正常关机或者锁定前所处的位置（参见选项67到70）。在正常关机或所有燃烧锁定情况下都会执行NFPA后吹扫。
136	5.1	<b>Gas pressure switch - offset lower limit:</b> This Option has two functions: <b>燃气压力开关 - 下限补偿值:</b> 这个选项具有两个功能: 1. Static inlet pressure check - lower limit. This is checked prior to burner firing. 入口静压检查 - 下限值，在燃烧器燃烧之前检查。 2. Run pressure check - lower limit. 运行压力检查 - 下限值 This is an offset from the commissioned value. Refer to Option 131. 这是调试值的补偿值，参见选项131。 0.1 - 5 "wg/ 0.2 - 12.4 mBar/ PSI not available (Sensor MM80006) "wg/ 0.2 - 12.4 mBar/ 不采用PSI (感应器 MM80006) 0.4 - "wg/ 1.1 - 63mBar/ 0.02 - 0.91 PSI (Sensor MM80008) "wg/ 1.1 - 63mBar/ 0.02 - 0.91 PSI (感应器 MM80008) 1 - 56 "wg/ 2.5 - 140mBar/ 0.04 - 2.03 PSI (Sensor MM80011) "wg/ 2.5 - 140mBar/ 0.04 - 2.03 PSI (感应器 MM80011) 1.9 - 103 "wg/ 4.6 - 356 mBar/ 0.07 - 5.16 PSI (Sensor MM80012) "wg/ 4.6 - 356 mBar/ 0.07 - 5.16 PSI (感应器 MM80012) 5.6 - 307 "wg/ 13.9 - 765mBar/ 0.20 - 11.09 PSI (Sensor MM80014) "wg/ 13.9 - 765mBar/ 0.20 - 11.09 PSI (感应器 MM80014)
137	5.1	<b>Gas pressure switch - offset upper limit:</b> This works in the same way as Option 136 but checks the upper limits. This is an offset from the commissioned value. Refer to Option 131. <b>燃气压力开关 - 上限补偿值:</b> 与选项136的原理一样，但设定的是上限补偿值。参见选项131。 0.1 - 5 "wg/ 0.2 - 12.4 mBar/ PSI not available (Sensor MM80006) "wg/ 0.2 - 12.4 mBar/ 不采用 PSI (感应器 MM80006) 0.4 - "wg/ 1.1 - 63mBar/ 0.02 - 0.91 PSI (Sensor MM80008) "wg/ 1.1 - 63mBar/ 0.02 - 0.91 PSI (感应器 MM80008) 1 - 56 "wg/ 2.5 - 140mBar/ 0.04 - 2.03 PSI (Sensor MM80011) "wg/ 2.5 - 140mBar/ 0.04 - 2.03 PSI (感应器 MM80011) 1.9 - 103 "wg/ 4.6 - 356 mBar/ 0.07 - 5.16 PSI (Sensor MM80012) "wg/ 4.6 - 356 mBar/ 0.07 - 5.16 PSI (感应器 MM80012) 5.6 - 307 "wg/ 13.9 - 765mBar/ 0.20 - 11.09 PSI (Sensor MM80014) "wg/ 13.9 - 765mBar/ 0.20 - 11.09 PSI (感应器 MM80014)

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			"wg/ 13.9 - 765mBar/ 0.20 - 11.09 PSI	(感应器 MM80014)
138	0		<b>Unused.</b>	未使用
139	0		<b>Unused.</b>	未使用
140	0		<b>Unused.</b>	未使用
141	0		<b>Air Proving Pressure Threshold for Purge:</b>	空气校验压力阈值, 用于吹扫
		0 - 300	0"wg (0mbar) - 12.040"wg (30.0mbar)	
142	60		<b>Shutter test interval:</b>	快门测试间隔
		4 - 240	Seconds.	秒
143	0		<b>No Pre-purge:</b>	无前吹扫
	0		Pre-purge operates.	前吹扫运行
	1		No pre-purge.	无前吹扫
144	4		<b>Maximum allowed UV self-check errors:</b>	允许的最大紫外线自检错误数量
		1 - 12	Number of errors.	错误数量
145	0		<b>Unused.</b>	未使用
146	0		<b>Air Pressure Sensor Units:</b>	空气压力感应器单位
	0		"wg	
	1		mbar	
147	0		<b>Air Pressure Error:</b> Only active during modulation. The burner will shut down if outside this window.	空气压力错误: 只在控制期间有效。超出范围时燃烧器将关闭
		0 - 300	0"wg (0mbar) - 12.040"wg (30.0mbar)	
148	0		<b>Air Pressure Sensor Type:</b>	空气压力感应器类型
	0		Air switch on Terminal 54.	终端54上的空气开关
	1		Autoflame air pressure sensor.	Autoflame空气压力感应器
	2		Autoflame air pressure sensor and air switch on Terminal 54.	Autoflame空气压力感应器和终端54上的空气开关
149	10		<b>Air Proving Pressure Threshold:</b>	空气校验压力阈值:
		10	0.401"wg (1mbar)	
		7 - 300	0.281"wg (0.7mbar) - 12.040"wg (30.0mbar)	
150	0		<b>Fuel 1 - Fuel Type:</b>	燃料1 – 燃料类型
	0		Gas.	燃气
	1		Oil.	燃油
151	1		<b>Fuel 2 - Fuel Type:</b>	燃料2 – 燃料类型
	0		Gas.	燃气
	1		Oil.	燃油
152	0		<b>Unused.</b>	未使用
153	0		<b>Unused.</b>	未使用
154	0		<b>Terminal T80 Function:</b>	终端T80功能
	0		Not used.	

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			未使用
		1	Start Position Interlock.
			启动位置的连锁
		2	Night Setback Input.
			夜晚调低输入
		3	Reduced Setpoint Input.
			降低设定点值输入
155	0		<b>Terminal T81 Function:</b>
			<b>终端T81功能</b>
		0	Not used.
			未使用
		1	Purge Interlock.
			吹扫连锁
		2	Low Flame Hold Input.
			输入保持低火焰
156	0		<b>Terminal T82 Function:</b>
			<b>终端T82功能</b>
		0	Warming Stat.
			加温控制点
		1	Valve Proving Mains Input.
			阀门校验，干线信号输入
157	0		<b>Unused.</b>
			未使用
158	0		<b>Unused.</b>
			未使用
159	0		<b>Unused.</b>
			未使用
160	0		<b>Clear ALL commissioning data:</b>
			<b>清除所有调试数据</b>
		5	Clear ALL commissioning data, and restore options/ parameters to default settings.
			清除所有调试数据，恢复选项/参数的默认值
		10	Reset all options to default.
			重置所有选项值到默认
		15	Reset all parameters to default.
			重置所有参数值到默认
		20	Reset all BC options and parametes to default.
			重置所有燃烧器控制选项值和参数值到默认

## 2.2 Parameters

### 参数

Please refer to section 2.1 Options for instructions on accessing and changing parameters.

请查阅章节2.1“选项”来了解读取和更改参数的方法。

Commission Mode		
Options	Parameters	
#	Description	Value
1	DTI: Sequence Scan Time Set When Unit Goes Offline	3 minutes (00:03:00)
2	Unused: Parameter 2	0
3	DTI: Number of Boilers Initially On	1
4	EGA: Delay Before EGA Commission Can Be Stored	45 seconds
5	DTI: Modulation Timeout	10 minutes (00:10:00)
6	Unused: Parameter 6	0
7	Unused: Parameter 7	0
8	EGA: Trim Delay After Drain	30 seconds
9	Unused: Parameter 9	0
10	EGA: EGA Version	Mk8
11	Unused: Parameter 11	0
12	EGA: CO Used For Trim On Oil	Disabled
13	EGA: Commission Fuel-Rich Trim	5.0 %
14	EGA: Negative Trim Reset Angle	5.0°

Figure 2.2.i Parameters

Figure 2.2.i 参数

Figure 2.2.i shows the Parameters screen. Like with the Options, the Parameters can be easily viewed by feature by pressing the tabs MM, PID, EGA, DTI and BC.

Figure 2.2.i是参数界面。和选项界面一样，按下标签MM, PID, EGA, DTI和BC可以方便地读取分组后的参数数据。

A full list of parameters are detailed on the next pages. Options/ parameters 110 – 160 are the burner control settings and are safety critical; these must be entered the same for both the option and parameter value.

从下页开始列出了完整参数列表。选项/参数110 – 160是燃烧器控制的设置，也是安全方面的关键设置，这些选项和参数必须在数值上保持相同。

Param eter	Factory Setting	Param eter	Description
No.	工厂设 置值	value	描述
参数 编号	参数数 值	参数数 值	
1	3		<p><b>Sequence Scan Time Set When Unit Goes Offline:</b> If a sequenced boiler drops out of the sequence, there is a time delay before the next scan time. E.g. if this parameter is 3 minutes then when the standby boiler fails to start there is a 3 minute delay before the next scan time.</p> <p><b>设备下线时的排序扫描时间设置:</b> 如果一台排序锅炉退出排序，在发生下次扫描前会有一时间延迟。例如：如果本参数是3分钟，当发现一台待机锅炉不启动后执行下次扫描之前的延迟时间是3分钟。</p>
		0 - 20	Minutes. 分钟
2	0		<b>Unused.</b> 未使用
3	1		<p><b>Number of Boilers Initially On:</b> This sets numbers of boilers which power on initially after a shutdown. This should be set to the highest M.M. ID (parameter 57) if the application requires all boilers to come on.</p> <p>初始上线的锅炉数量：本参数是在全体锅炉关闭后再次上线的锅炉数量。如果想让全体锅炉共同上线，应该将本参数设置成最高的控制模块编号（参数57）。</p>
		1 - 10	
4	45		<p><b>Delay Before E.G.A. Commission Can Be Stored:</b> During commissioning and single point change, the E.G.A. there is delay before the E.G.A. values are stored. This allows some time for the E.G.A. values to stabilise.</p> <p><b>存储E.G.A.调试值的延时：</b>在调试时和单点变更时，存储E.G.A.数值前将有一个延时。这是为了获得稳定的E.G.A.数值。</p>
		10 - 120	Seconds. 秒
5	10		<p><b>Modulation Timeout:</b> If the boiler is not modulating after being asked to contribute to the load after this timeout, it is kicked out of the sequence loop e.g. burner must start to modulate within 10 minutes (as default) of receiving command to contribute to load.</p> <p><b>控制超时：</b>如果在本参数设置的时间内添加锅炉荷载控制失败，该锅炉将被迫退出排序。例如：在收到指令后燃烧器必须在10分钟（默认值）内控制成功。</p>
		1 - 50	Minutes 分钟
6	0		<b>Unused.</b> 未使用
7	0		<b>Unused.</b> 未使用
8	30		<p><b>Trim Delay After Drain:</b> This is the delay after draining before trim cycle starts (washout period). When the E.G.A. drainings and the cells are cleaned with air this value maintains the E.G.A. readings from before the drain period for 'n' seconds to allow the air to clear from the E.G.A.</p> <p><b>排出冷凝水后的EGA调节延时：</b>在完成冷凝水排放后，EGA要等待一段时间（清洗期）然后进入调节周期。在排放冷凝水和清洁感应器（用空气清洁）之后的“n”秒时间内，系统将维持冷凝水排放之前的EGA读数。这是为了让空气全部从EGA排出。</p>
		5 - 240	Seconds. 秒
9	0		<b>Unused.</b> 未使用
10	2		<p><b>E.G.A. Version:</b> <b>E.G.A.版本</b></p>
		0	Mk7 E.G.A.
		2	Mk8 E.G.A.
11	0		<b>Unused.</b> 未使用
12	0		<b>CO Used for Trim on Oil:</b> CO included in trim calculation when firing oil for fuels 2, this is also required when using natural gas on fuel 2.

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			<b>烧油锅炉EGA调节时的CO使用:</b> 当锅炉燃料2为燃油, 调节计算应包括CO计算; 在锅炉燃料2为天然气时, 调节计算也应包括CO计算。
		0	Disabled. 参数关闭
		1	Enabled. 参数开启
13	50		<b>Commission Fuel-Rich Trim:</b> The % of air damper movement, when commissioning the fuel rich cycle trim. <b>调试富油EGA调节:</b> 当调试富油调节时风门挡板角度的百分比。 Value 50 = 5.0% degrees 数值50 = 5.0%角度
14	50		<b>Negative Trim Reset Angle:</b> This is the change in fuel angle per minute that will reset trim. <b>负值EGA调节重置角度:</b> 这是执行重置调节时每分钟燃料阀角度的变化。 <i>Note: This also applies to positive trim if option 18 is set to no carry forward of trim.</i> <b>注意:</b> 这也适用于EGA正值调节, 如果选项18被设定为“不延续调节值”。
		0 - 900	Value 50 = 5.0o 数值50 = 5.0o
15	5		<b>Golden Start Time:</b> Number of seconds that the servomotors are held at the golden start (choke) position. <b>黄金启动时间:</b> 伺服马达保持在黄金启动位的时长。 See option 29. This time starts from the ignition point. 查阅选项29。黄金启动时间从点燃点开始计算。
		2 - 100	Seconds 秒
16	12		<b>Time Between Air Calibrations (Mk 7 E.G.A. only):</b> The time between calibrations if burner does not go off <b>两次空气校正的间隔(仅使用Mk 7 E.G.A.):</b> 如果燃烧器未停止, 这是两次空气校正的间隔。 Value 12 = 6.0 hours. 数值12 = 6.0小时
17	3		<b>Number of Trims Before Limits Error Generated:</b> Number of trims before an E.G.A. error is flagged when the combustion limits are exceeded. <b>发出极限值错误信息前的调节次数:</b> 当超出燃烧极限值时, 发出E.G.A.错误提示之前的调节次数。
		0 - 10	Number of trims. 调节次数
18	100		<b>Maximum Trim During Run:</b> The % of trim amount during run. <b>运行时的最大调节幅度:</b> 运行时的调节幅度百分比。 Value 100 = 10.0%. 数值100 = 10.0%.
19	50		<b>Commission Air-Rich Trim:</b> The % of air damper movement, when commissioning the air rich cycle trim. <b>调试富氧EGA调节:</b> 调试富氧调节操作时的风门开度百分比。 Value 50 = 50.0%. 数值50 = 50.0%.
20	0		<b>Unused.</b> 未使用
21	0		<b>Unused.</b> 未使用
22	0		<b>Unused.</b> 未使用
23	0		<b>Add Air When CO Present:</b> Trim to add air when CO is present. When trim is taking place, if the O2 and CO2 appear on air rich but the CO appears on fuel rich then the air damper will open further to remove CO. <b>当存在CO时添加空气:</b> 当存在CO时添加空气。在E.G.A.调节期间如果富氧时存在O2和CO2并且富油时存在CO, 那么要进一步打开空气挡板来去除CO。 0 Disabled. 参数开启 1 Enabled. 参数关闭
24	120		<b>Air Calibration Time (Mk7 E.G.A. ):</b> <b>空气校准时间(Mk7 E.G.A. ):</b> 20 - 300 Seconds. 秒

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25	0	<b>Unused.</b> 未使用
26	8	<b>Trim Samples per Cycle:</b> 单个调节周期内的EGA样本: Number of trims. 调节次数
27	0	<b>Unused.</b> 未使用
28	0	<b>Unused.</b> 未使用
29	1000	<b>Load Sensor Adjustment:</b> This adjusts the load sensor (voltage) reading, as a percentage of the reading. <b>荷载感应器调节:</b> 本参数通过更改读数的百分比来调节荷载感应器（电压）读数。 Value 1000 = 100.0 % of deg C or deg F 数值1000 = 100.0 %的摄氏度数值或者华氏度数值
30	10	<b>Load Sensor Filter Time:</b> <b>荷载感应器过滤时间</b> Seconds. 秒
31	0	<b>Efficiency Calculation Method (Mk7 E.G.A. only):</b> <b>能效计算方法（仅使用Mk7 E.G.A.）</b> 0 English (USA/ Canada - incorporates hydrogen & moisture loss). 英国（美国/加拿大 – 包含氢和湿度损失计算） 1 European. 欧盟
32	0	<b>Unused.</b> 未使用
33	0	<b>Unused.</b> 未使用
34	0	<b>Unused.</b> 未使用
35	0	<b>Unused.</b> 未使用
36	0	<b>Unused.</b> 未使用
37	0	<b>Unused.</b> 未使用
38	***	<b>Commissioning Password Code 1:</b> <b>调试密码口令1:</b> 0 - 255 Code 1 口令1
39	***	<b>Commissioning Password Code 2:</b> <b>调试密码口令2</b> 0 - 255 Code 2 口令2
40	0	<b>Unused.</b> 未使用
41	0	<b>Unused.</b> 未使用
42	0	<b>Unused.</b> 未使用
43	0	<b>Unused.</b> 未使用
44	0	<b>Unused.</b> 未使用
45	0	<b>Unused.</b> 未使用
46	0	<b>Unused.</b> 未使用
47	0	<b>Unused.</b> 未使用
48	80	<b>Integral Band:</b> This is the percentage of the proportional band over which the integral control is active.

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		<b>整体积分带:</b> 本参数值是比例带的百分比，在整体积分带内实行的是整体积分控制。
	0 - 100	Value 80 = 80% 数值80 = 80%
49	0	<b>Unused.</b> 未使用
50	0	<b>Unused.</b> 未使用
51	0	<b>Unused.</b> 未使用
52	0	<b>External Load Detector - Number of Decimal Places:</b> This affects parameter 53 and 55. The voltage entered in parameter 54 and 56 must be set to scale factor 10 (see table below). <b>外部荷载检测器 – 小数位:</b> 这将影响参数53和55的数值。参数54和56的电压必须带有比例因子10（参见下表）
53	0 - 2	<b>External Load Detector - Maximum Value:</b> <b>外部荷载检测器 – 最大值</b>
	0 - 9990	Value 20 = 20 Bar (PSI) or 20 deg C (deg F) 数值20 = 20 Bar (PSI) 或者 20 deg C (deg F)
54	0	<b>External Load Detector - Maximum Voltage:</b> <b>外部荷载检测器 – 最大电压</b>
	0 - 100	Value 100 = 10.0V 数值100 = 10.0V
55	20	<b>External Load Detector - Minimum Value:</b> <b>外部荷载检测器 – 最小值</b>
	0 - 9990	Value 20 = 20 Bar (PSI) or 20 deg C (deg F) 数值20 = 20 Bar (PSI) 或者 20 deg C (deg F)
56	0	<b>External Load Detector - Minimum Voltage:</b> <b>外部荷载检测器 – 最低电压</b>
	0 - 100	Value 100 = 10.0V 数值 100 = 10.0V
57	10	<b>Sequencing - Highest M.M. ID:</b> This sets the number of M.M.s in that sequencing loop for improved comms. <b>排序 – 控制模块标识的最大值:</b> 排序回路中控制模块的标识编号。实现更好的相互通讯。
58	1 - 10	<b>Air Calibration on Startup (Mk7 E.G.A. only):</b> <b>启动时的空气校正（仅使用Mk7 E.G.A.）</b>
	0	Disabled. 参数关闭
	1	Enabled. 参数开启
59	0	<b>Unused.</b> 未使用
60		<b>Logo Display Timer (Standby):</b> If a custom logo has been saved to the M.M., then after the time set in this parameter while the M.M. is in standby mode, the custom logo will appear on the screen. <b>商标显示定时器（待机）:</b> 如果控制模块内已存有客户商标，在控制模块待机本参数的时长后，控制模块屏幕将显示客户商标。
	0	Disabled. 参数关闭
	1 - 3600	Seconds. 秒
61	900	<b>Display Backlight Dim Time:</b> Set to zero for the backlight to stay on at all times. After the time set in this parameter, the M.M.'s backlight will dim. <b>屏幕背景灯转暗:</b> 参数为0时屏幕背景灯将一直保持明亮；经过本参数时间值

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			后背景灯将转暗。
		0 - 1800	Seconds 秒
62	0		<b>Hot water sequencing:</b> <b>热水排序</b>
		0	Hot water sequencing operates normally. 正常热水锅炉排序
		1	Hot water sequencing operates as steam sequencing. 热水锅炉根据蒸汽锅炉排序法
			<b>Note:</b> Lag boilers will operate as per option 41. <b>注意:</b> 滞后锅炉将根据选项41来运行。
63	0		<b>Unused.</b> 未使用
64	0		<b>Unused.</b> 未使用
65	0		<b>Unused.</b> 未使用
66	0		<b>Unused.</b> 未使用
67	0		<b>Unused.</b> 未使用
68	0		<b>External Modulation Control Range:</b> The range is set for either low fire to high fire, or zero to high fire. <b>外部控制的范围:</b> 该控制范围可以是从低火到高火或者是从零到高火。
69	0		<b>External Modulation Input Range:</b> <b>外部控制的输入信号范围:</b>
		0	0 - 10V (0 - 20mA)
		1	2 - 10V (4 - 20mA)
			<b>Note:</b> A 500ohm resistor needs to be placed across the terminals to use as 4 - 20mA. <b>注意:</b> 通过一个跨接终端37, 38的500欧姆电阻可使用4 - 20mA电流输入。
70	0		<b>Unused.</b> 未使用
71	0		<b>Unused.</b> 未使用
72	0		<b>Unused.</b> 未使用
73	0		<b>Unused.</b> 未使用
74	0		<b>Unused.</b> 未使用
75	0		<b>Unused.</b> 未使用
76	0		<b>Unused.</b> 未使用
77	0		<b>Unused.</b> 未使用
78	0		<b>Unused.</b> 未使用
79	0		<b>Unused.</b> 未使用
80	0		<b>Unused.</b> 未使用
81	0		<b>Unused.</b> 未使用
82	0		<b>Unused.</b> 未使用
83	0		<b>Display Diagnostic Values:</b> <b>显示判别值</b>
		0	Disabled 参数关闭
		1	Enabled 参数启用
84	0		<b>Unused.</b> 未使用

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85	0	<b>Modulation Exerciser Period:</b> Repeatedly run between high and low flame. The higher the value, the longer high/low flame position is held for. <b>控制作业时限:</b> 在高火焰和低火焰之间重复运行。本参数值越大，保持在高火焰和低火焰位置运行的时段越长。
	0 - 3600	Seconds 秒
86	85	<b>IBS Change Down Threshold:</b> If the combined firing rate of the last 2 boilers is below this value, then the last lag boiler will go into the next stage (standby, warming, or off) depending on how the sequencing is set. <b>智能锅炉排序降速阈值:</b> 当排序最接近的两台在线滞后锅炉的联合燃烧率低于这个数值时，根据排序情况两台滞后锅炉的后一台将进入下一阶段（待机，升温，或者关闭）。
	0 - 99	%
87	95	<b>IBS Change Up Threshold:</b> If the firing rate of the first last boiler online is above this value, then the next boiler will come online and fire to meet the required setpoint. <b>智能锅炉排序加速阈值:</b> 当排序最接近的在线滞后锅炉的燃烧率高于这个数值，为了满足燃烧率要求下一台滞后锅炉将要上线运行。
	0 - 100	%
88	1000	<b>Outside Temperature Sensor Adjustment:</b> If the actual reading is too high set a negative value to adjust, if the reading is too low set a positive value. <b>室外温度感应器调节:</b> 如果实际读数太高，应设置一个负数来调节；如果实际读数太低，应设置一个正数来调节。
	500 - 2000	Value 1000 = 100.0% 数值1000 = 100.0%
89	0	<b>Stat Exerciser Period:</b> <b>控制点作业时限</b>
	0 - 3600	Seconds 秒
90	0	<b>Unused.</b> 未使用
91	0	<b>Unused.</b> 未使用
92	0	<b>Unused.</b> 未使用
93	0	<b>Unused.</b> 未使用
94	0	<b>NO Upper Limit Offset:</b> This is an offset limit from the commissioned values, if the NO is above this limit an alarm will occur. <b>NO上限补偿值:</b> 这是调试数据的补偿极限值，当NO高于这个极限值时警报响起。
	0	Disabled. 参数关闭
95	0	1 - 200 <b>Unused.</b> 未使用
96	0	<b>Exhaust Temperature Upper Limit Offset:</b> This is an offset limit from the commissioned values. <b>烟气温度上限补偿值:</b> 这是调试数据的补偿极限值。
	0	Disabled. 参数关闭
97	0	1 - 999 <b>Exhaust Temperature Absolute Limit:</b> System checks for exhaust temperatures higher than this value. <b>烟气温度绝对上限:</b> 系统检查烟气温度是否高于该上限值。
	0	Disabled. 参数关闭
98	0	1 - 999 <b>Unused.</b> 未使用
99	0	<b>Graceful Shutdown:</b> In changing/ deselecting fuels, the burner will modulate to low fire and shut down, recycle the system and then changes fuels. <b>燃料转换时的关机:</b> 在转换/取消燃料时，燃烧器会调节到低火和关机，随后进入系统再循环和更换燃料。
	0	Disabled.

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			参数关闭
1			Enabled.
			参数开启
			<b>Note:</b> Graceful shutdown can not be used if changeover relays are used on the system.
			注意：当系统使用转换继电器时不能使用“燃料转换关机”。
100	0		<b>Assured Low Fire Shut Off:</b>
		0	保证低火关机：
			Disabled.
		1	参数关闭
			Enabled.
			参数开启
101	0		<b>Shuffle Sequencing:</b> This allows the sequence order to be changed remotely through the D.T.I. or Modbus.
		0	改变锅炉排序：本参数允许D.T.I.或者 Modbus 远程改变锅炉排序顺序。
			Disabled.
		1	参数关闭
			Enabled.
			参数开启
102	0		<b>Unused.</b>
			未使用
103	0		<b>Unused.</b>
			未使用
104	0		<b>Unused.</b>
			未使用
105	0		<b>Unused.</b>
			未使用
106	0		<b>Unused.</b>
			未使用
107	***		<b>Online Changes Password Code 1:</b>
		0 - 255	线上更改密码口令1
			Code 1
			口令1
108	***		<b>Online Changes Password Code 2:</b>
		0 - 255	线上更改密码口令2
			Code 2
			口令2
109	0		<b>Unused.</b>
			未使用

**NOTE:** Parameters 110 - 160 are a repeat of their respective options. These values need to be entered as both an Option value and a Parameter value for safety reasons. Please refer to section 2.1 Options.

注意：参数110 - 160的数值只是重复选项110-160的数值。出于安全考虑，这些数值必须保持对应一致。请参阅章节2.1选项。

### 3. COMMISSIONING PROCEDURE

#### 调试流程

##### 3.1 Introduction to Commissioning

###### 调试简介

**Important Note:** Prior to commissioning, the fuel and air servomotors must be calibrated to ensure that the position of the valves and damper correspond to the potentiometer feedback signal as displayed on the Mini Mk8 M.M. When the valve is fully closed, the M.M. should display zero degrees. If it does not, please adjust the servomotor potentiometer.

**重要告知:** 在进行调试之前要校准燃气伺服马达和空气伺服马达的阀门位置，要确保它们和Mk8微型控制模块屏幕上显示的电位计反馈信号一致。当阀门完全关闭时控制模块屏幕应该显示零角度，否则可以通过调节伺服马达电位计来解决。

**The commissioning procedure as described must be strictly adhered to. Anybody commissioning a Micro-Modulation system must have an adequate understanding of combustion plant. In the wrong hands hazardous conditions could be made to exist. The Autoflame products must only be installed, set up, commissioned and adjusted by an Autoflame certified technical engineer.**

必须严格按照这里所述的流程来调试。系统调试人员必须充分理解燃烧设备。非专业人员执行的调试操作可能会造成危险。Autoflame产品只能由Autoflame认证的技术工程师来安装，设置，调试和调节。

**The fundamental idea of the system is to set a fuel valve position and then set a corresponding air damper position. Care must be taken when adjusting the fuel and air positions so as not to create any unstable or hazardous combustion conditions, e.g. moving the fuel valve to the open position without increasing the air damper position. Improper use may result in property damage, serious physical injury or death.**

控制系统的理论基础是设置一个燃料阀门位置和一个对应的空气挡板位置。应仔细调节燃料和空气位置并且保证不造成任何不稳定或者危险的燃烧条件，比如：把燃气阀门调节到开启位的时候未相应增大空气挡板的开度。使用不当可能会导致财产损失，严重的人身伤害或伤亡。

If the M.M. is commissioned without an E.G.A. then a combustion analyser is required to check the exhaust gases. If the system does have an E.G.A., then a combustion analyser is not necessary as the E.G.A. performs all normal exhaust gas measurements. When burning oil a smoke detection device is also necessary to check that the smoke generated is within safe limits.

如果控制模块的调试不带E.G.A.那么就需使用燃烧分析仪来检查尾气。如果系统带有E.G.A.那么就无需使用燃烧分析仪，因为E.G.A.能够执行所有常规的尾气测量。当燃烧燃油时，系统还需配有烟雾探测装置来检查烟雾是否超出安全极限。

To implement commissioning as quickly as possible, arrange for a substantial load on the boiler. The commissioning procedure can be interrupted due to excess temperature or pressure, causing the burner to turn off. In these instances the commissioning data accumulated so far is not lost, provided power is not lost to the M.M. When the burner is called back on the system starts up automatically and commissioning can proceed from where it was left.

为了尽快完成调试，锅炉的运行要带有相当的荷载量。过高的温度/压力会中断调试过程并且造成燃烧器关闭。当发生这种情况时，只要控制模块仍然通电那么所有已有的调试数据就不会丢失。当燃烧器恢复运行后，系统将自动启动并且从上次中止处继续进行调试。

Once a low firing position has been established, the high fire position is entered first, then descending fuel/air positions are entered consecutively until finally a minimum fuel position is entered. The CH1 and CH2 positions must always be less than the ones previously entered.

在建立了低火位置后，系统首先进入高火位置，然后操作者输入逐步降低的燃料/空气位置，直

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到最终获得最低燃料位置。CH1和CH2的位置必须始终低于之前输入的燃料/空气位置。

### **3.1.1 Commissioning Procedure**

#### **调试流程**

On a newly installed system the following procedures should be carried out as listed:

对一个新装系统要执行以下流程：

1. Check all interconnecting wiring between the M.M. and external components is correct.  
检查控制模块与外部部件的连接线路是否正确。
2. Set options and parameters required (refer to sections 2.1 and 2.2).  
设置正确的选项值和参数值（参阅章节2.1和2.2）
3. Set up servomotors.  
设置伺服马达
4. Program fuel/air positions.  
设计好燃料/空气的位置

### **3.2 Installation Checks**

#### **安装检查**

#### **3.2.1 Commissioning Checks**

##### **调试检查**

When all the installation and burner adjustments are completed, the entire burner control system should be tested in accordance with the manufacturer's instructions. The procedure should verify the correct operation of:

在完成所有安装和燃烧器调节操作后，操作者要根据制造商指导文件来检查整个燃烧器控制系统。需检查验证的具体内容如下：

1. Each operating control (temperature, pressure etc.)  
所有的运行控制（温度，压力等等）
2. Each limit switch (temperature, pressure, low water cut-off, etc.)  
所有的限位开关（温度，压力，低水位切断，等等）
3. Each interlock switch (airflow switch, high and low fuel pressure or temperature switches, purge and low fire switches, fuel valve proof of closure interlock etc.)  
所有的互联开关（空气开关，高燃气压力或温度开关/低燃气压力或温度开关，吹扫和低火开关，燃料阀门关闭校验连锁等等）
4. Pilot flame failure response and lockout.  
导燃火焰的故障响应和锁定
5. Main flame failure response and lockout.  
主火焰的故障响应和锁定
6. Tight shut-off for all valves.  
所有阀门的完全关闭

#### **3.2.2 Operational Checks**

##### **运行检查**

1. Close manual main shut-off valve.  
关闭手动主截止阀。
2. Check all limit circuit wiring for proper operation and correct connection.  
检查所有限流电路的正常运行和正确连接。
3. Confirm that the automatic main fuel valves are wired correctly.  
确认自动主燃料阀门的接线正确。
4. Power the control and electronically check the proper sequence of operation.  
控制器通电，检查运行的适当排序。
5. After assuring yourself that all the interlocks and valves are properly wired and that the sequence

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of operation is correct, open the manual main shut-off fuel valve and proceed cautiously through the boiler light off process. Check all safety interlocks for proper shutdown of the boiler.

在确保所有联锁和阀门接线正确和运行顺序的正确后，打开手动主截止阀并且仔细执行锅炉点火过程。检查所有锅炉关机的安全联锁。

**WARNING: COMMISSIONING OR BURNER START-UP MUST ONLY BE CARRIED OUT BY A FACTORY TRAINED TECHNICIAN.**

警告：锅炉调试或者启动只能由经过工厂培训的技师来操作。

### **3.2.3 Installation Precautions**

#### **安装注意事项**

The reliability of the equipment may be impaired if used in environments where strong electromagnetic fields exist e.g. if the equipment is installed in a boiler house where radio systems exist then additional EMC (Electro Magnetic Compatibility) measures may have to be considered. Please contact Autoflame for more information.

设备的可靠性在强电磁场环境下会遭到破坏。例如：在锅炉房周围存在电磁场时，系统要采取额外的电磁兼容措施来对抗。请咨询Autoflame来获得更多相关信息。

### **3.2.4 Maintenance and Servicing**

#### **维护和保养**

The Micro-Modulation unit uses solid state technology. It requires no routine maintenance. 微型控制设备采用坚实的制造科技。微型控制设备无需例行保养。

The servomotors/gas/oil/FGR valves do require routine maintenance. Any fault associated with these parts is usually diagnosed by the M.M. Contact Autoflame for preventative maintenance procedures, please refer to the Valves and Servomotors manual for general checks.

伺服马达/燃气阀门/燃油阀门/烟气再循环阀门都需要定期维护。微型控制模块可以诊断这些部件的故障。请联系Autoflame来了解预防性维护程序，请参阅阀门和伺服马达手册了解阀门检查的信息。

### **3.3 Servomotors**

#### **伺服马达**

Autoflame supply three standard sizes of servomotors – small, large and industrial, which can be used for all channels. Autoflame fuel valves require small or large servomotors only. Both small and large servomotors can be configured to drive clockwise or counter clockwise to open a valve or damper. Servomotors can be installed in any orientation; 2 fixed rotation positions if using Autoflame valves. For layout of the small, large and industrial servomotors please refer to the Valves and Servomotors manual.

Autoflame提供三种标准尺寸马达 – 小型，大型和工业型，它们可用于所有频道。Autoflame燃料阀门只使用小型或者大型伺服马达。小型和大型马达都能顺时针或者逆时针转动来打开阀门或者挡板。伺服马达的安装朝向可以是任意方向，Autoflame阀门具有两个固定转动位置。请参阅阀门和伺服马达手册来获得小型，大型和工业型伺服马达的布局图。

Viewing the shaft end-on, from the potentiometer end, all servomotors drive in a clockwise direction if power is applied between the LIVE and CW terminals, and counter clockwise if the power is applied between the LIVE and CCW terminal.

从阀杆端看去，当电源接线位于火线端和顺时针端之间时阀门都是顺时针转动；当电源接线位于火线端和逆时针端之间时阀门都是逆时针转动。

The operation of fuel valves and air dampers is often such that they open in a clockwise direction. If

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the operation needs to be reversed, it is necessary to swap various wiring connections between the M.M. and the servomotor(s). An example of reversing the operation of a servomotor is shown in Figure 3.3.3.

燃气阀门和空气挡板的转动方向一般是顺时针。可以通过交换控制模块和伺服马达之间的接线端子来改变阀门/挡板的转动方向，图例3.3.3说明了改变伺服马达运行方向的方法。

**Note: Servomotors are supplied by the factory set at 0.0 position. Remember that this position may not necessarily automatically position the damper at 0.0 or a closed position. This must be physically checked. Failure to do so can result in serious injury or death.**

注意：工厂供应的伺服马达设置是0.0位，但是这不代表伺服马达一定处于0.0位或关闭位。在使用前必须检查挡板位置。忽视这项检查会造成严重人身伤害或伤亡。

### 3.3.1 Adjusting the Servomotor Potentiometer

#### 调节伺服马达电位计

Before a burner is fired it is essential to set up each Micro-Modulation servomotor. A tamper proof screwdriver is required (please contact Autoflame).

在燃烧器燃烧前要设置微型控制模块的伺服马达，这需要使用防干扰螺丝刀（请联系Autoflame）。

Usually control valves/air dampers that the servomotors drive, move through up to 90 angular degrees. The M.M. system has the ability to drive valves through 360 degrees, but the M.M. will only display from -6 to 96 degrees.

通常伺服马达驱动的控制阀门/空气挡板的最大开度是90度。微型控制系统能够将它们开启360度，但是微型控制系统只显示-6度到96度。

All Channel 1 to 3 readings displayed on the M.M. are in angular degrees. It is necessary to adjust the potentiometer in the servomotor assembly so that the M.M. reads 0.0 when the relevant valve/damper is at its fully closed position. The technician must physically check the mechanical position of the dampers and valves, whilst all servomotors are set to 0.0 before leaving the factory this may have changed during shipping. DO NOT ASSUME THEY HAVE BEEN PREVIOUSLY SET CORRECTLY.

控制模块显示的频道1到频道3数值均为角度值。在必要情况下要调节伺服马达电位计，确保当相关阀门/挡板处于全闭时控制模块显示的数值是0.0。技师必须检查挡板和阀门的机械位置，这是由于在出厂后的运输途中伺服马达的0.0位置可能会发生变化。不要假定伺服马达的初始设置都是正确的。

To set up a servomotor, first ensure option 12 is set to 0, (this prevents E.G.A. errors from allowing continuation). Put the M.M. into the commissioning mode and press CLOSE to position the valve/damper mechanically by using the appropriate up and down buttons (see section 3.4.2).  
要设置伺服马达，首先确保选项12的值是0（这是防止E.G.A.错误）。然后切换到控制模块的调试模式，按下CLOSE并且选择UP和DOWN按钮来机械定位阀门/挡板（参见章节3.4.2）

#### \*\*WARNING\*\*

**ELECTRICAL CONNECTIONS ARE LIVE/HOT AND INCORRECT APPLICATION MAY  
RESULT IN SERIOUS PHYSICAL INJURY OR DEATH.**

#### \*\*警告\*\*

电气连接带有电流，不正确使用会导致严重人身伤害或伤亡。

Remove the servomotor cover.

移除伺服马达盖板

- \* For air servomotors carry out the following procedure:

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\* 对空气伺服马达执行以下操作流程:

Use the channel 2 up/down buttons on the M.M. to position the air damper to its physically closed position. Loosen the two tamper proof screws just enough to enable the potentiometer to rotate. Rotate the potentiometer clockwise or counter clockwise until the relevant channel reads 0.0.

Tighten the two tamper proof screws gently until the potentiometer is secure. Do not over tighten the screws. Check that the display still reads 0.0. If incorrect repeat the adjustment process.

使用控制模块上频道2的UP/DOWN按钮将空气挡板定位到全闭位置。适当松开两个防干扰螺钉，使电位计旋转。顺时针或逆时针旋转电位计直到相关频道的读数变为0.0。轻轻紧固防干扰螺钉直到电位计的安装变得坚固，不要过分紧固螺钉。然后再次检查读数是否为0.0。如果仍不正确，应重复上述操作。

- \* For fuel servomotors carry out the following procedure:

\* 对于燃料伺服马达执行以下流程:

On Autoflame gas, oil and gas/oil piggy-back valves it is necessary to remove the servomotor.

Manually position the oil/gas valve slot to its closed position. Observe the position of the drive pin on the servomotor. Use the relevant channel up/down buttons to position the pin so that when the servomotor is reassembled to the valve it is in line with the slot. Reassemble the servomotor to the valve, loosen the two tamper proof screws and proceed to adjust the potentiometer position until 0.0 is displayed. Use the external position indicator to ensure the valve is in the fully closed position.

对于Autoflame燃气阀，燃油阀和油气一体阀必须要移除伺服马达。

手动定位燃油/燃气阀的阀槽到关闭位。观察伺服马达上传动销的位置。用相关频道的up/down按钮来定位传动销，要保证伺服马达被装回后与阀槽位置对齐。将伺服马达装到阀门上，松开两个防干扰螺钉，然后调节电位计位置直到控制模块屏幕显示0.0位。使用外部示位仪来确保阀门处于全闭。

### 3.3.2 Servomotor Feedback Voltage

#### 伺服马达反馈电压

In applications where the servomotor is not positioned close to the display then it is possible to measure the feedback voltage from the servomotor in order to ensure that 0.0 degrees is displayed. By testing the DC voltage between the blue and green wires (wiper and 0V) on the servomotor low voltage terminals this will read 0.21V DC when the reading on the display is 00. The same can be done for when the servomotor is at 96.00 where the voltage will be 3.6V.

当实际使用的伺服马达位置与屏幕数值不符，可通过测量伺服马达反馈电压来确保阀门全闭时屏幕的显示值为0.0。当伺服马达低压端口上蓝线和绿线之间的直流电压测量值是0.21V DC时屏幕的显示数值应是0.0度。当伺服马达角度为96.0度的直流电压测量数值应是3.6V。

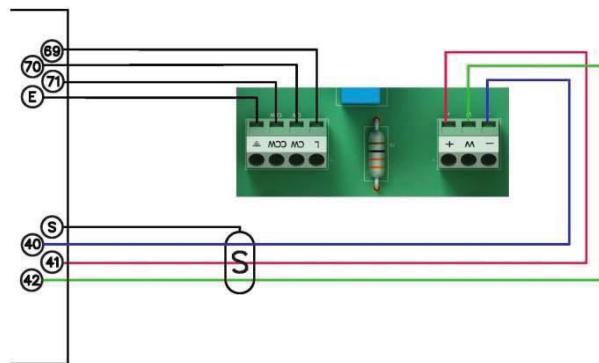
### 3.3.3 Servomotors – Direction Change

伺服马达 – 改变马达转动方向

MOTOR CLOCKWISE ROTATION

FIG. A

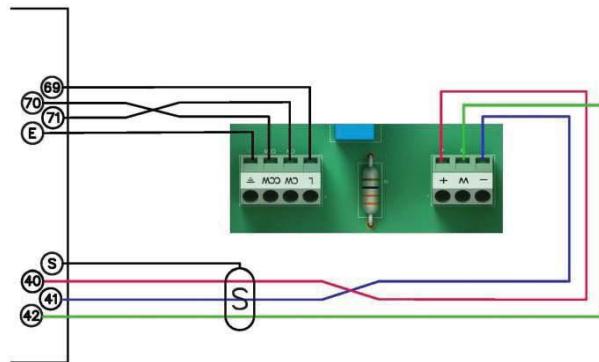
M.M. MODULE



MOTOR ANTICLOCKWISE ROTATION

FIG. B

M.M. MODULE



FOR ILLUSTRATION PURPOSES FUEL MOTOR CONNECTIONS ARE SHOWN.

### 3.3.4 Servomotors with Autoflame Valves

#### 带有Autoflame阀门的伺服马达

On threaded valves, the pin on the top of the valve is 90 degrees opposite from the position of the butterfly valve.

丝扣阀头部的阀销与蝶阀成90度角。

On flanged valves, the pin on the top of the valve is in line with the position of the butterfly valve.

法兰阀头部的阀销与蝶阀成0度角。

For both valves the external visual position indicator is in line with the position of the butterfly valve.

Regardless of the type of valve being used, the servomotor is dispatched from the factory with the

potentiometer in the zero position. The same servomotor will be correct for both types of valve, as

the servomotor for the threaded valve is mounted at 90 degrees different from the flanged valve.

这两种阀门的外部示位条和蝶阀的实际朝向是相同的。不管选用哪种阀门，所供应的伺服马达的电位计在出厂时都处于0位置。丝扣阀和法兰阀都使用同一种伺服马达，但是伺服马达在这两种阀门上的安装角度相差90度。

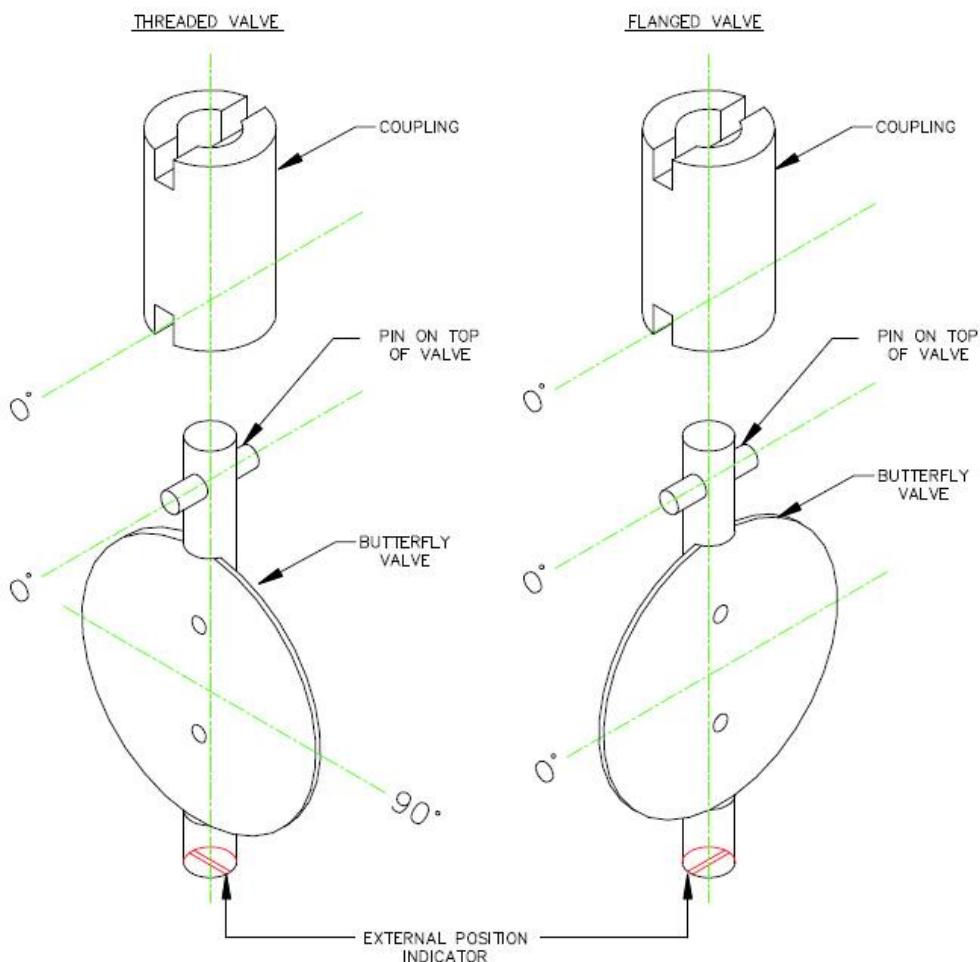


Figure 3.3.4.i Valve Pin Positions

阀销位置

### 3.4 Commissioning Fuel and Air Positions

#### 调试燃油和空气位置

The following procedure is shown for commissioning the E.G.A. with option 12 set to 0 (Not Optioned), or 1 (Monitoring only). Trim can be added later by setting option 12 to 2 (Applies trim) or 3 (Applies trim, combustion limits tested). Please see section 3.7 for adding/adjusting the trim data later during Single Point Change.

以下调试操作步骤适用于当选项12被设为0（E.G.A.功能未选）或1（E.G.A.仅监视）时。操作者可以在以后某时点添加E.G.A.调节功能，方法是将选项12设为2（E.G.A.调节）或者3（E.G.A.调节，测试燃烧极限）。请参阅章节3.7来了解如何使用“单点变更”来添加/调整E.G.A.调节。

**Note:** For option 12 set to 0 or 1 during commissioning, omit section 3.4.6. For option 12 set to 2 or 3 during commissioning, please include section 3.4.6.

**注意：**当在调试阶段中选项12被设置成0或者1，读者可省略章节3.4.6。当在调试阶段中选项12值被设置成2或者3，读者需要阅读章节3.4.6。

The fuel and air positions need to be programmed for the following points: CLOSED, OPEN, GOLDEN START (if optioned), FGR START (if optioned), LOW FIRE (START), INTER POINTS, and HIGH FIRE.

操作者要设置各个位置的燃料和空气位：关闭位，开启位，黄金启动位（若在选项中启用），烟气再循环启动位（若在选项中启用），低火位（启动点），中间位，和高火位。

There must be a minimum of 0.5° gap between the positions entered on the fuel channel.

在燃料频道上输入的各个位置之间至少要有0.5度的间隔。

There must be a minimum of 3 INTER points entered on the fuel-air curve, and a maximum of 18. Points can be added in Single Point Change mode (see section 3.7).

燃料 – 空气曲线上的中间位至少为3个，至多为18个。操作者可在单点更改模式下添加中间位（参见章节3.7）。

During commissioning the required setpoint is not active; the internal stat remains made at all times regardless of the actual value. Ensure that the high limit stat is set correctly and wired into the recycling interlock (T53), as this will turn the burner off in the event that the safe working maximum temperature or pressure of the system is exceeded.

所设的各设定点在调试过程中并不起作用；内部控制点将一直保持有效。确保正确的上限控制点设置，上限控制点要与再循环联锁端口（T53）连接。在最大安全工作温度或压力被超出时，上限控制点将关闭燃烧器运行。

The OPEN and CLOSE positions are stored during commissioning, so if a lockout occurs during the initial burner light-off, there is no need to re-enter the OPEN and CLOSE positions. The burner will restart once the lockout has been reset and go straight to purge. Once purge is completed, you will be prompted again to set the START POSITION. However, if power is completely removed from the system then these positions are not retained in the memory, and the OPEN and CLOSE positions will need to be re-entered.

调试过程将保存开启位和关闭位。即使在燃烧器初始点火阶段出现锁定，操作者无需再次输入开启位和关闭位。一旦锁定被重置，燃烧器重启后将直接进入吹扫。在吹扫完成后，系统将再次提示设置启动位。但是如果系统电源中断，模块中将不再存有任何位置信息，操作者就只得重新输入开启位和关闭位。

**Note:** The high limit stat should be set below the rating of the safety valve.

**注意：**上限控制点数值应该低于安全阀的额定压力值。

### 3.4.1 Starting Commissioning

开始调试

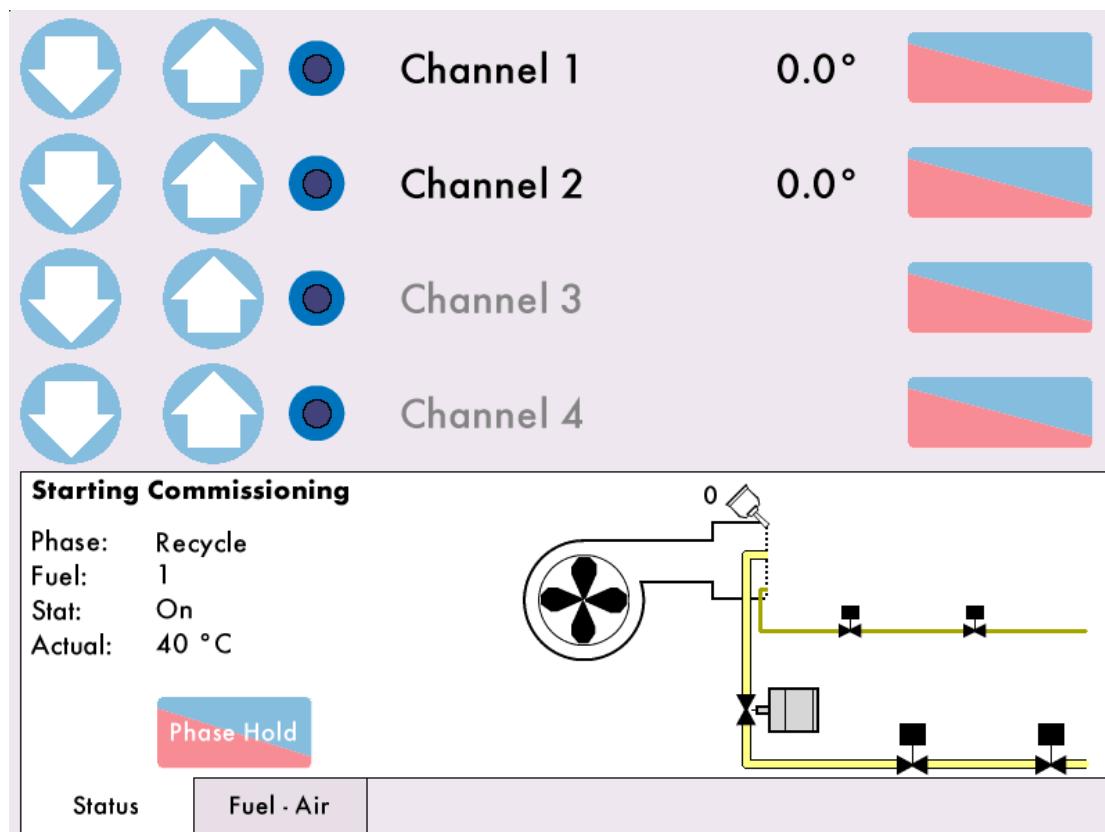


Figure 3.4.1.i Starting Commissioning  
开始调试

Once the options and parameters have been set, press on the Commission Mode screen in Figure 2.1.ii. If the M.M. has already been commissioned, then press on the Home Display.

完成了选项和参数设置后，按下示意图2.1ii调试模式屏幕上的 按钮。如果控制模块已被调试过，可直接按下主页上的 按钮。

### 3.4.2 Enter CLOSE Position

输入关闭位置

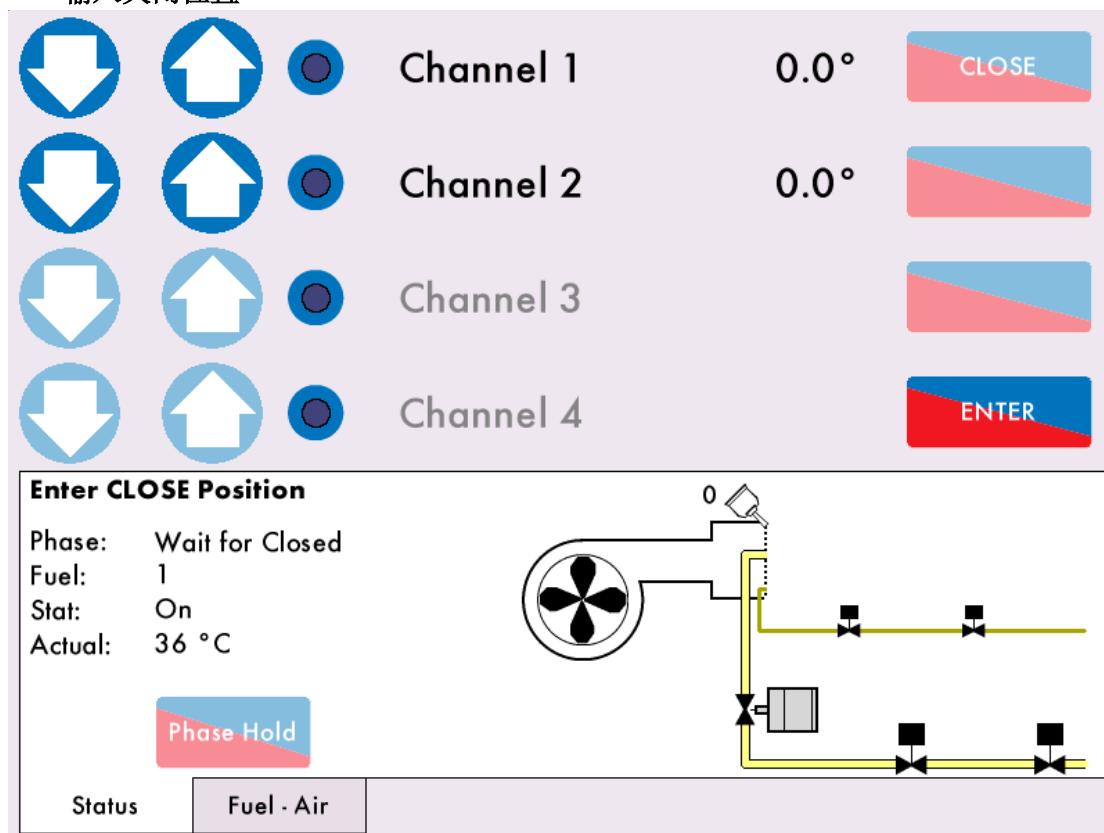


Figure 3.4.2.i Enter CLOSE Position

输入关闭位置

The M.M. is now waiting for the CLOSE position to be entered. Press to enter this position.

这时需要输入关闭位置。按下 按钮并且输入关闭位置。

**Note:** No error checking of the servomotors is enabled at this stage, therefore, do not to drive the servomotors/ dampers beyond any mechanical limitations that may be present on the damper/valve. This may cause damage to the servomotor and/or the damper/valve.

**注意:** 在这个阶段不能执行伺服马达的错误检查。操作者不得过于开启伺服马达/挡板或者使它们的开度超出机械极限。这会导致伺服马达和/或挡板/阀门的损坏。

Use the buttons to set the positions to 0.0°.

使用按钮 来设置0.0值。

**Note:** Double check the damper/valve is physically at the 0.0 (closed) position. This can be achieved by checking for external indications on the damper assembly or the fuel valve. It is the engineer's responsibility to ensure that the servomotors are correctly calibrated. Incorrect calibration can cause serious injury or death.

**注意:** 再次检查挡板/阀门是否处于0.0（关闭）位置。操作者可以通过观察挡板/燃料阀的“外部示位条”来判断阀门位置是否正确。调试工程师要确保伺服马达都经过正确校准。不正确的

伺服马达校准会导致严重的人身伤害和伤亡。

Press  to store the CLOSE position. The burner motor output T58 will energise at this point. A message will then be displayed 'Enter OPEN Position.'

按下  按钮来保存关闭位置的设置。燃烧器马达输出端T58这时将运行，屏幕上出现信息“输入开启位”。

### 3.4.3 Enter OPEN Position

输入开启位置

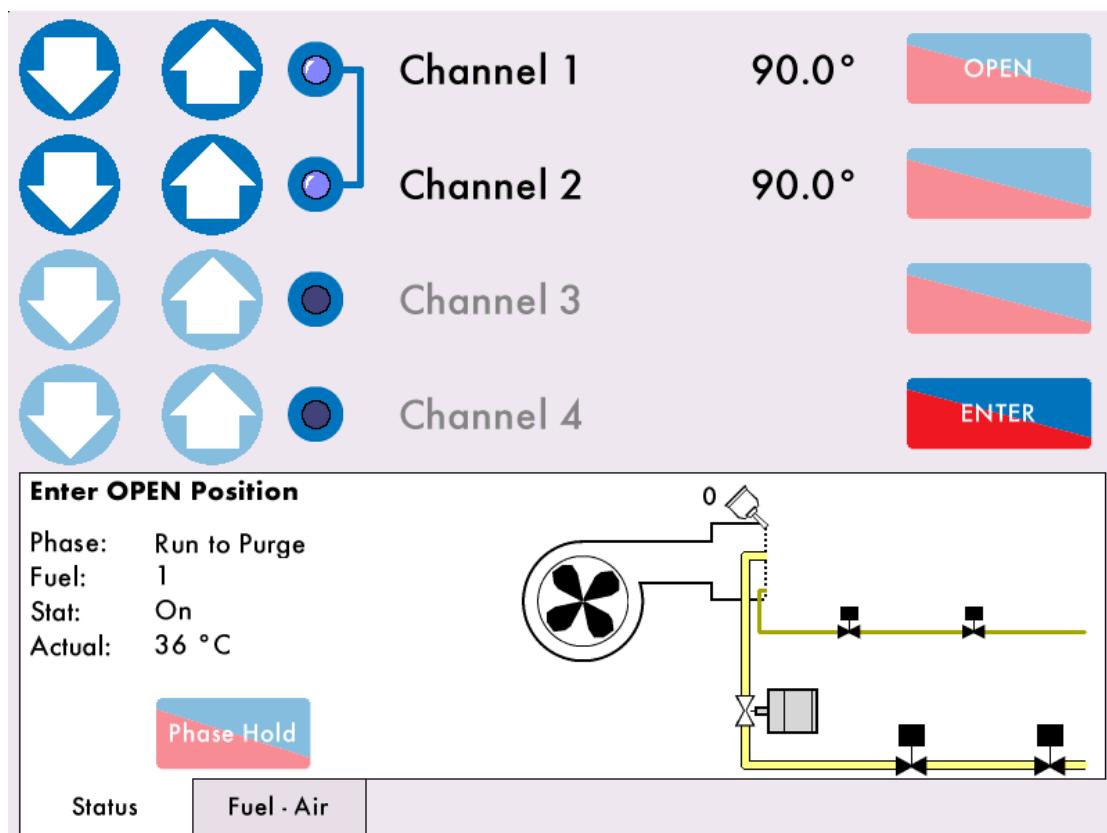


Figure 3.4.3.i Enter OPEN Position

输入开启位置

Press  and then drive the fuel and air servomotors to their OPEN position. The button hold facility allows multiple channels to be driven up or down at the same time. Press on the blue

circles  next to the channels; once selected they the blue circles will be filled and a blue line will appear as above in Figure 3.4.3.i to indicate the channels are selected.

按下  按钮，然后将燃料伺服马达和空气伺服马达打开到开启位置。通过使用“按键保持”功能可以同时调高或者调低多个频道的位置。操作者按下频道一侧的蓝圈 。蓝圈一旦选定就会填满，与此同时将出现上方示意图3.4.3i中的蓝线来表明频道已选定。



Use the buttons to drive both servomotors to the OPEN position simultaneously. This is normally 90.0° for gas butterfly valves and burner air dampers, but may be set to less than 90.0° if there are mechanical stops/limits. Channel 4 cannot be adjusted at this stage, its calibration is dictated by the drive set-up and relevant options.



用 按钮同时将燃料伺服马达和空气伺服马达打开到开启位置。燃气蝶阀和燃烧器空气挡板一般角度为90度，但是当存在机械极限时它们的角度也可被设为小于90度。在这个阶段不能够调节频道4，频道4的校准要取决于驱动设置值和相关选项值。

Press to save the OPEN positions.

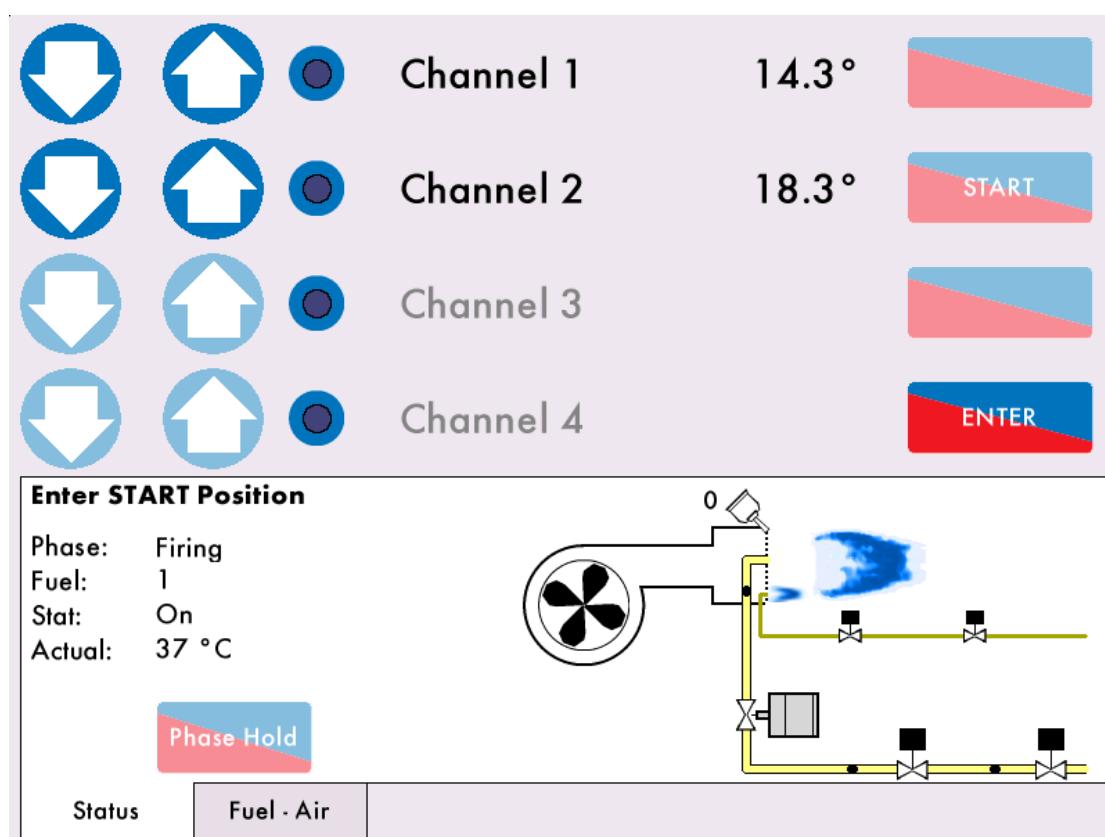
按下 来保存开启位置的设置。

Pressing on the Fuel-Air tab at any time will give you a graph showing the fuel and air servomotor angles.

用户可以随时按下燃料 - 空气标签来查看燃料伺服马达角度和空气伺服马达角度的图示。

### 3.4.4 Enter START Position

输入启动位置





Press and drive the servomotors to their START position. To enter a fuel START position which is less than 10 degrees below the OPEN position, you must drive the servomotor below this band, and then back open. For example, if the CH1 OPEN position is set at 90.00, to set a CH1 START position of 83.00, you must drive the CH1 servomotor to below 80.00 and then to 83.00.



按下 按钮来将燃料伺服马达和空气伺服马达打开到启动位置。燃料启动位要比开启位要小10度以内。所以在输入燃料启动位置角度的时候用户必须先将启动位置角度设置成比开启位置角度小10度的数值，然后再反方向调节。例如：如果频道1的开启位置是90度，要设置83度的频道1启动位置，用户应先将频道1伺服马达启动位置设为低于80度然后再反方向调节到83度。

**\*\*WARNING\*\* ENTERING THE START POSITION BEFORE REDUCING FUEL INPUT APPROPRIATELY COULD RESULT IN SERIOUS PHYSICAL DAMAGE OR DEATH.**

**\*\*警告\*\*** 在输入启动位数据前要适当降低燃料输入量，否则有可能导致严重的人身伤害或者伤亡。



Press to enter the START position, where ignition can take place; these fuel and air positions are not stored permanently as it is just a light-off position to put a flame in the boiler and begin the commissioning process.



按下 按钮并输入启动位置数值，这将是发生点火的时点；因为它们只是锅炉点火的位置信息所以系统不会一直储存这些燃料和空气的位置数据。锅炉点火后进入调试流程。

### 3.4.5 Phase Hold

#### 阶段保持

When the system is in commissioning mode only, the Phase Hold feature enables the commissioning engineer to pause the ignition sequence of the burner to make adjustments to the start gas flame if needed.

当系统仅处于调试模式中，调试工程师可使用“阶段保持”功能来暂停燃烧器点火时序，以便根据需要调节燃气启动火焰。

If the flame goes out during this time a lockout is set after 20 seconds. If the flame is present and the ‘phase hold’ condition is left indefinitely a lockout will be set after 10 minutes. The ‘phase hold’ feature can also be activated during the pilot prove and main flame prove phases.

如果火焰在“阶段保持”期间熄灭，系统将在火焰熄灭20秒后锁定。如果火焰未熄灭但是“阶段保持”条件持续超过10分钟，系统也会锁定。操作者在导燃火焰校验和主火焰校验阶段也可以启用“阶段保持”功能。

When the system is in a run mode the facility is disabled.

在系统处于运行模式下不能启用这个功能。



To make adjustments with the gas manually, press to keep the system at its current phase positions, a little blue dot on this ‘button’ will appear to indicate that the phase is held. Ensure that the main fuel valve is manually isolated until the pilot flame has been successfully established. Once this has been successfully established, gradually introduce the main fuel supply to the burner while observing the flame stability. Continue to introduce fuel until the manual operated main fuel isolation valve is fully open providing safe and stable combustion that can be maintained. If the combustion is not safe and stable, then adjust the fuel/air ratio accordingly. Once the adjustments

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have been made, press  to continue with the commissioning process.

如果要在锅炉燃气情况下做手动调节，按下  按钮可使系统停留在当前阶段，“按钮”上出现小蓝点表明系统正使用“阶段保持”功能。在成功建立导燃火焰之前要确保主火焰阀门的手动隔离。在成功建立导燃火焰后，逐步加大燃烧器的主燃料供给，与此同时要观察火焰稳定性。继续加大燃料供给直到手动主燃料截止阀完全开启，燃料供给要保证维持燃烧过程的安全和稳定。如果燃烧过程不安全稳定，应相应调节燃料/空气比。完成调节后，按下  按钮来继续下一步调试步骤。

**\*\*WARNING\*\***

**IT IS THE RESPONSIBILITY OF THE FACTORY TRAINED TECHNICIAN TO ENSURE THAT USE OF THE PHASE HOLD FACILITY DOES NOT LEAD TO A HAZARDOUS SITUATION. FAILURE TO DO SO WILL RESULT IN SERIOUS EQUIPMENT DAMAGE, CRITICAL INJURY OR DEATH.**

**\*\*警告\*\***

接受过工厂培训的技师要确保正确使用“阶段保持”功能。错误使用“阶段保持”会导致危险状况的发生，会造成严重的设备损坏和重大的人身伤害或伤亡。

### 3.4.6 Add Trim Data During Commissioning

在调试阶段添加EGA调节数据

If the option 12 is set to 2 or 3 during commissioning, then when setting the servomotors for the HIGH, INTER, GOLDEN START, FGR START and START positions, the trim data will also need to be saved for the fuel rich and air rich trim conditions. The message ‘Waiting for EGA readings’ will display.

在选项12被设置为2或3的情况下，用户在进行伺服马达高火位，中间位，黄金启动位，烟气再循环位和启动位的设置时还要设置富油和富气条件下的EGA调节数据。屏幕这时将显示“等待E.G.A.读数”。

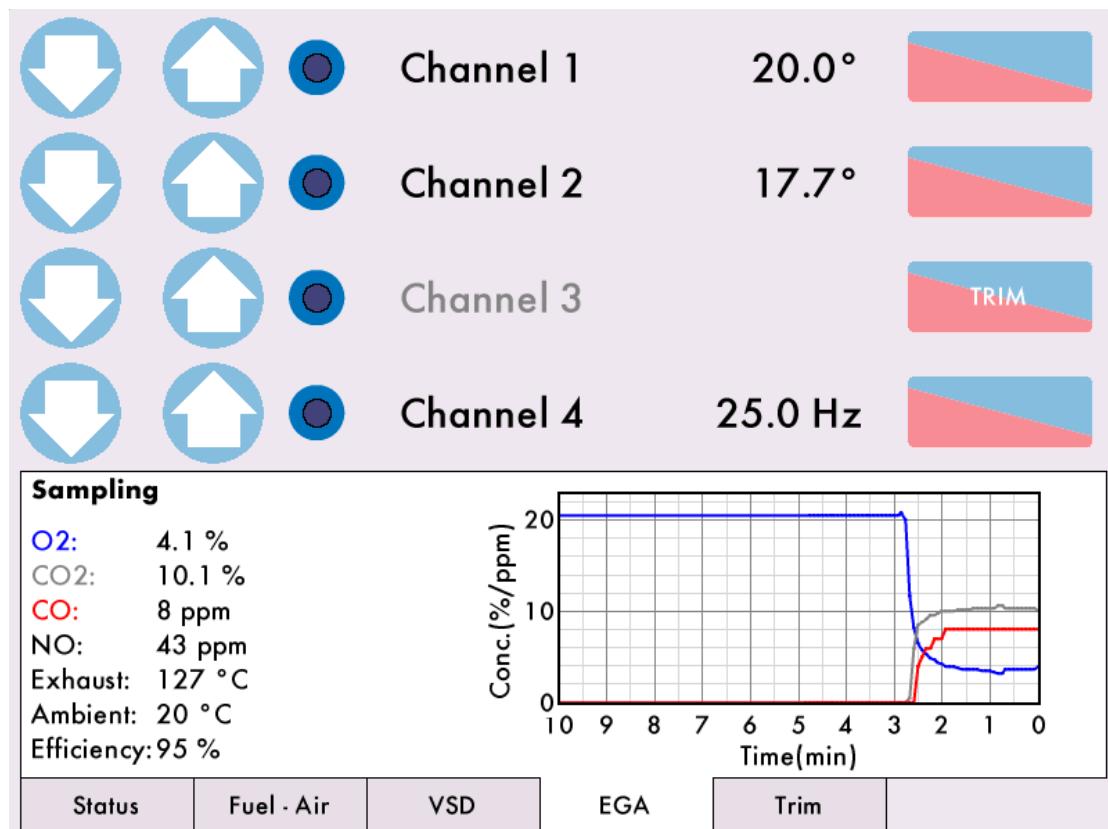


Figure 3.4.6.i Sampling

取样

Press on the EGA tab to display the EGA readings.

按下EGA标签来显示EGA读数。

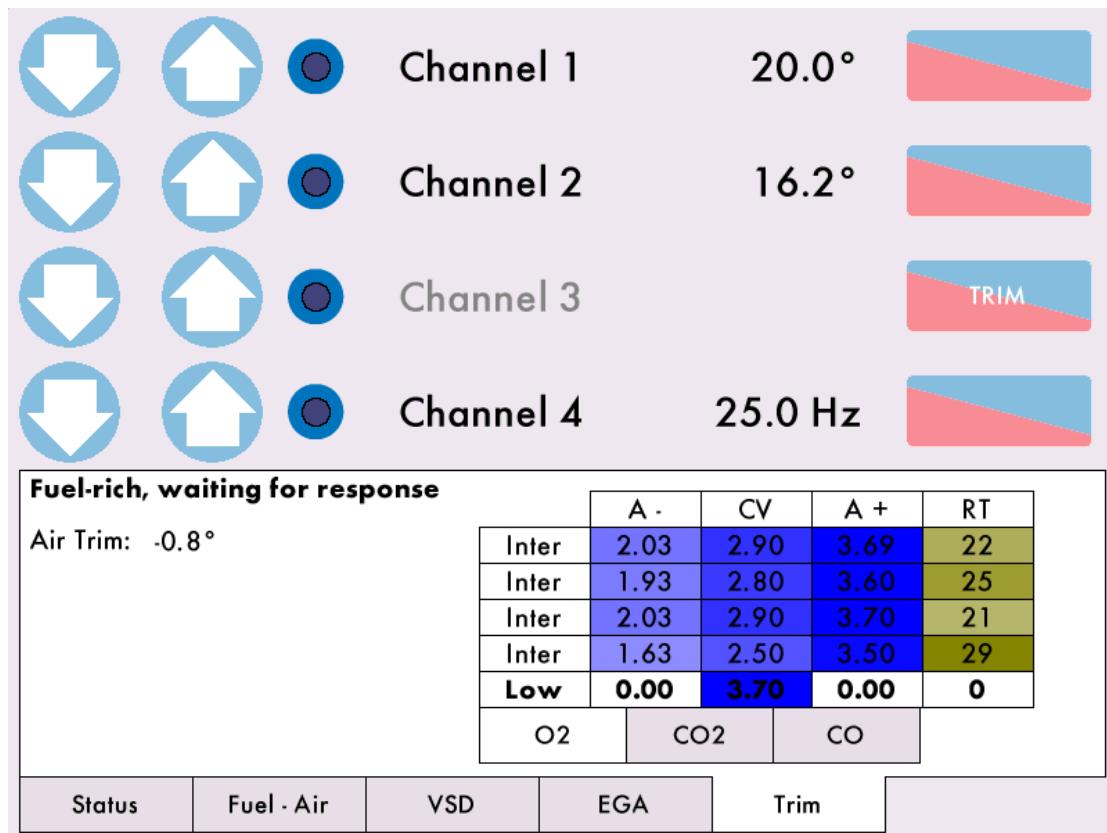


Figure 3.4.6.ii

After you press to save those servomotor positions, the E.G.A. will carry out its fuel rich and air rich trim.

在按下 按钮来保存伺服马达位置数据后，E.G.A.将执行富油调节和富气调节。

Once these trim values have been saved, the system will continue with the commissioning process.  
在这些调节数据被保存后，系统将继续进入下个调试步骤。

### 3.4.7 Commissioning VSD

调试变速驱动



Figure 3.4.7.i Commissioning VSD

调试变速驱动

Press on the VSD tab to view the VSD output and input signal during commissioning.

用户在调试期间按下变速驱动标签可以获知变速驱动的输出和输入信号。

### 3.4.8 Set GOLDEN START Position

#### 设置黄金启动位

If Golden Start (see option 29) has been enabled and the system hasn't already been commissioned, then the message 'Set Golden Start Position' will display after the START position has been entered

in section 3.4.4. Press  to enter the GOLDEN START position. Continue through the commissioning process.

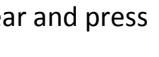
如果要启用黄金启动位（参阅选项29）并且系统还没有经过调试，那么在输入启动位置（章节3.4.4）后屏幕上会显示“设置黄金启动位”。按下  按钮来输入黄金启动位，然后继续下一步调试。

To enable GOLDEN START after the M.M. has already been commissioned, option 29 must be changed in Commission Mode. Press  and once the system goes through its relay checks, the message 'Select Commissioning' will appear. It is possible to just add the GOLDEN START position, or go through the entire commissioning process again:

如果要在控制模块调试完成之后启用黄金启动，必须先在调试模式下更改选项29的值。按下  按钮，在系统完成继电器检查后控制模块屏幕上将出现“选择调试”页面。用户可以选择只添加“黄金启动位置”也可以选择重新进行整个调试。

1. To re-commission the M.M., proceed as described in sections 3.4.2 and 3.4.3. After entering the START position the message 'Set Golden Start Position' will appear. Press  to enter the GOLDEN START position, press  to store this and continue through the commissioning process to re-enter all the points.

如果选择重新进行整个调试，用户就要根据章节3.4.2和3.4.3输入各位置数值。在输入启动位置后控制模块屏幕将显示“设置黄金启动位”。按下  按钮来输入黄金启动位的值，按下  来保存黄金启动位，然后继续完成余下的调试步骤和输入其他数据。

2. To just add the GOLDEN START position, in the Select Commissioning screen press  . The system will purge and then you will be prompted to enter the START position, followed by  the GOLDEN START position. The message 'Save Commission' will appear, press  to store this GOLDEN START position. The message 'Commission Complete' will appear and press  to go to normal firing mode.

如果选择只添加“黄金启动位置”，用户要在“选择调试”页面上按下  按钮。系统将执行吹扫和提示输入启动位置的值，然后提示输入黄金启动位置的值。输入完毕后屏幕将出现“保存调试值”，按下  来保存黄金启动位。完成保存后屏幕将提示“调试已完成”，按下  按钮来回到正常燃烧模式。

#### NOTES:

#### 注意：

1. The Golden Start position of the fuel and air servomotors is completely independent from the modulating load index and commissioned value data.  
燃料伺服马达和空气伺服马达的黄金启动位是完全独立的数据，它们与控制荷载指数和调试数据无关。
2. The facility is particularly useful on combustion systems with large turndowns and when firing heavy oil, as it enables the burner to start/ignite at a fuel rich position and then, after a stable flame is established, return to the commissioned combustion curve.  
黄金启动位特别适用于较大调节比和燃烧重油的燃烧系统，这是因为黄金启动位让燃烧器在富油条件下启动/点火，在建立了稳定火焰后系统将再回归到燃烧曲线调试数值。
3. The Golden Start position needs to be entered for each required fuel.  
应设置每种燃料的黄金启动位置。
4. The M.M. holds the Golden Start position for a time set in Parameter 15, this time starts from the ignition point. After this time, if the Golden Start fuel position is between Low Fire and High Fire, the air damper will open and the fuel valve will stay in the same position, until fuel/air ratio is on the commissioned combustion curve. If the Golden Start fuel position is outside of the main curve, then both the air damper and fuel will go to the Low Fire position. Once on the commission curve, the M.M. will modulate as per load requirement.  
伺服马达停留在黄金启动位的时长是参数15的数值，停留时长从点火点开始计算。在黄金启动结束后，如果黄金启动的燃料位置处于低火焰和高火焰之间，操作者可以逐渐增加空气挡板的开启角度并且保持燃气阀门的开度不变来把燃料/空气比率调试到与燃烧曲线调试数值一致。如果黄金启动的燃料位置在主曲线范围之外，那么空气挡板和燃料阀门都要进入低火位置。在将燃料/空气比率调节到与燃烧曲线一致之后，控制模块将根据荷载要求来进行控制。

#### 3.4.9 Set FGR START Position

设置烟气再循环启动位

If FGR Start (see options 48, 49 and 50) has been enabled and the system hasn't already been

commissioned, then the message 'Set FGR Position' will display. Press  to enter the FGR START position. Continue through the commissioning process.

如果要启用烟气再循环启动位（参阅选项48, 49和50）并且系统还没有经过调试，控制模块屏

幕上将显示“设置烟气再循环位”。按下  按钮来输入烟气再循环启动位置，随后继续下一个调试步骤。

To enable FGR START after the M.M. has already been commissioned, option 48, 49 and/or 50 must be changed in Commission Mode. Press  and once the system goes through its relay checks, the message 'Select Commissioning' will appear. It is possible to just add the FGR START position, or go through the entire commissioning process again:

如果在完成控制模块调试后再启用烟气再循环启动设置，必须先在调试模式下更改选项48, 49

和/或50的值。按下  按钮，在系统完成继电器检查后控制模块屏幕将显示“选择调试”。用户可以选择只添加“烟气再循环启动位置”也可以选择重新进行整个调试。

1. To re-commission the M.M., proceed as described in sections 3.4.2 and 3.4.3. After entering the START position and/or GOLDEN START position in section 3.4.8 the message 'Set

FGR Position' will appear. Press  to enter the FGR START position, press  to store this and continue through the commissioning process to re-enter all the points.

如果选择重新调试控制模块，用户要根据章节3.4.2和3.4.3输入各数值。在操作者输入启动位置和/或根据章节3.4.8内容输入黄金启动位置后控制模块屏幕将出现“设置烟气再循环启动位”。按下  按钮来输入烟气再循环启动位置，按下  按钮来保存设置数据，然后继续完成余下的调试步骤和输入其他数据。。

- To add the FGR START position, in the Select Commissioning screen press  .The system will purge and then you will be prompted to enter the FGR START position. The message 'Save Commission' will appear, press  to store this FGR START position. The message 'Commission Complete' will appear and press  to go to normal firing mode.

如果选择只添加“烟气再循环启动位置”，用户要在“选择调试”屏幕上按下  按钮。系统将执行吹扫并且提示输入烟气再循环启动位置的值。输入完毕后屏幕将显示“保存调试值”，按下  来保存烟气再循环启动位，屏幕将显示“调试已完成”，按下  按钮来回到正常燃烧模式。

**Note:** If both Golden Start and FGR are optioned then the GOLDEN START position is entered before the FGR START position.

注意：如果系统同时启用“黄金启动”和“烟气再循环”，“黄金启动位”的输入要先于“烟气再循环启动位”的输入。

Flue Gas Recirculation (FGR) is a method whereby a quantity (approximately 15%) of the boiler flue gases are fed back to the burner and mixed with the combustion air. The virtue of FGR is the reduction of NOx gases. With the FGR facility, servomotor channel 3 can be used to control the amount of flue gas fed back. It is not good practice to feed back the gases when the flue gas is cold, so all the elements (i.e. servomotors and VSD) can be set at 'FGR' positions until the gases are hot. During this time the CH3 would normally be set closed. Once the FGR holding conditions are met, modulation takes place in the normal way using the curve entered during commissioning.

烟气再循环（FGR）是指部分锅炉烟气（大约15%）回流到燃烧器与助燃空气混合。烟气再循环能够减少NOx气体排放。在使用烟气再循环时，伺服马达频道3可以控制回流的烟气量。循环冷态烟气是没有意义的，所以各参数（比如：伺服马达和变速驱动）都被设置成热态烟气的再循环位置。在烟气处于冷态时频道3一般为关闭。一旦烟气再循环的保持条件成立，系统将根据调试曲线来执行正常控制。

FGR can be set as a Timer, Offset or Temperature Threshold (see options 48, 49 and 50).  
烟气再循环可被设置成定时器，补偿值或者温度阈值（参阅选项48, 49和50）。

**Note:** Golden start takes priority over FGR. Once the golden start timer has finished, the servomotors will go straight to the FGR start position.

注意：黄金启动在优先级上要高于烟气再循环。一旦保持黄金启动的时长结束，伺服马达将直接进入烟气再循环启动位。

### 3.4.10 Set HIGH Position

设置高火位置

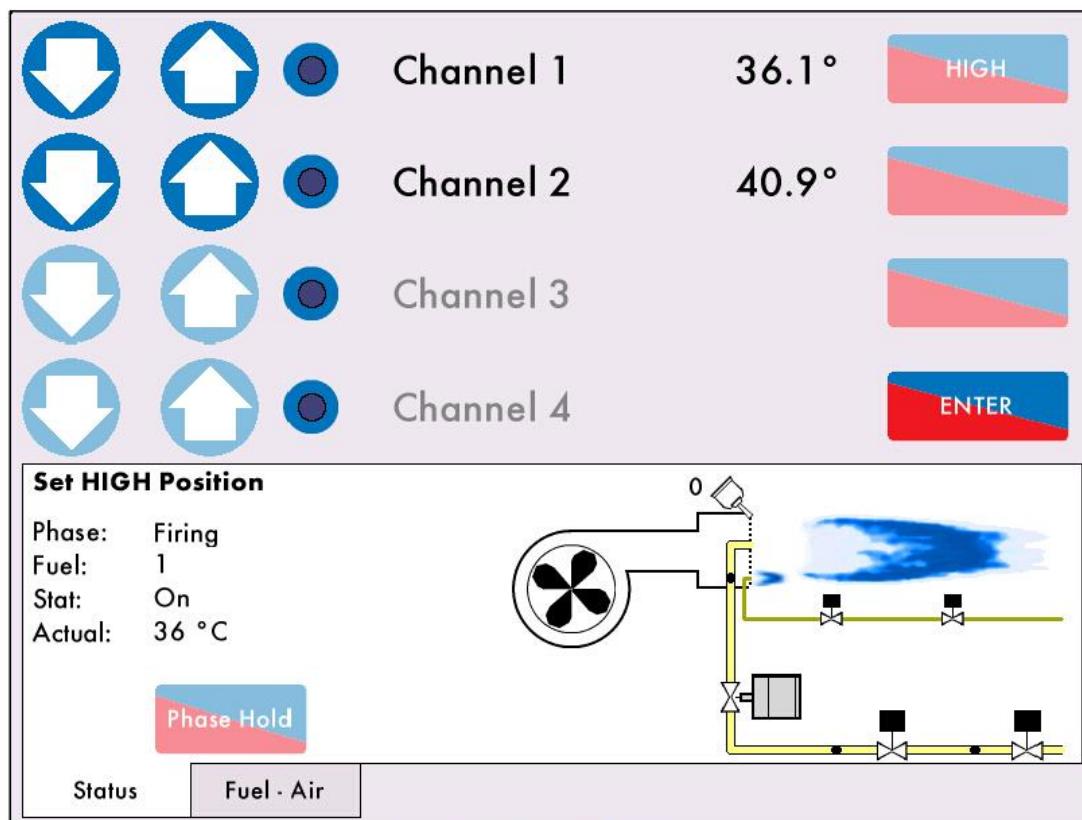


Figure 3.4.10.i Set HIGH Position

设置高火位置

Once all the START, GOLDEN START and FGR START positions have been entered, the message 'Set HIGH Position' will appear. Press and drive the servomotors (and VSD if optioned) to the HIGH position by opening the air damper and fuel valve some degrees alternatively, so that more fuel is added gradually.

在输入所有的启动位，黄金启动位和烟气再循环启动位之后，系统屏幕将显示“设置高火位置”。

按下 按钮并且将伺服马达（和变速驱动器，若启用）打开到高火位置，操作方法是交替打开空气挡板和燃气阀门，目的是向燃烧器逐渐添加更多燃料。

**\*\* WARNING\*\* IT IS THE RESPONSIBILITY OF THE COMMISSIONING ENGINEER TO ENSURE THAT THE FLAME IS SAFE AND THERE IS A GOOD COMBUSTION AT ALL TIMES DURING COMMISSIONING.**  
**\*\* 警告\*\* 调试工程师要保证全程调试过程中的火焰安全和良好燃烧。**

It is not possible to enter the HIGH position higher than the OPEN position. The servomotors must be driven 0.5° up/down from the previous point initially, before entering the next point, the fuel. Press

to store this HIGH position.

输入的高火位置一定比开启位置低。在输入下个位置点(即燃料)之前伺服马达最起码要向上/下调节0.5°度。按下 按钮来保存高火位置值。

### 3.4.11 Set INTER Position

设置中间位置

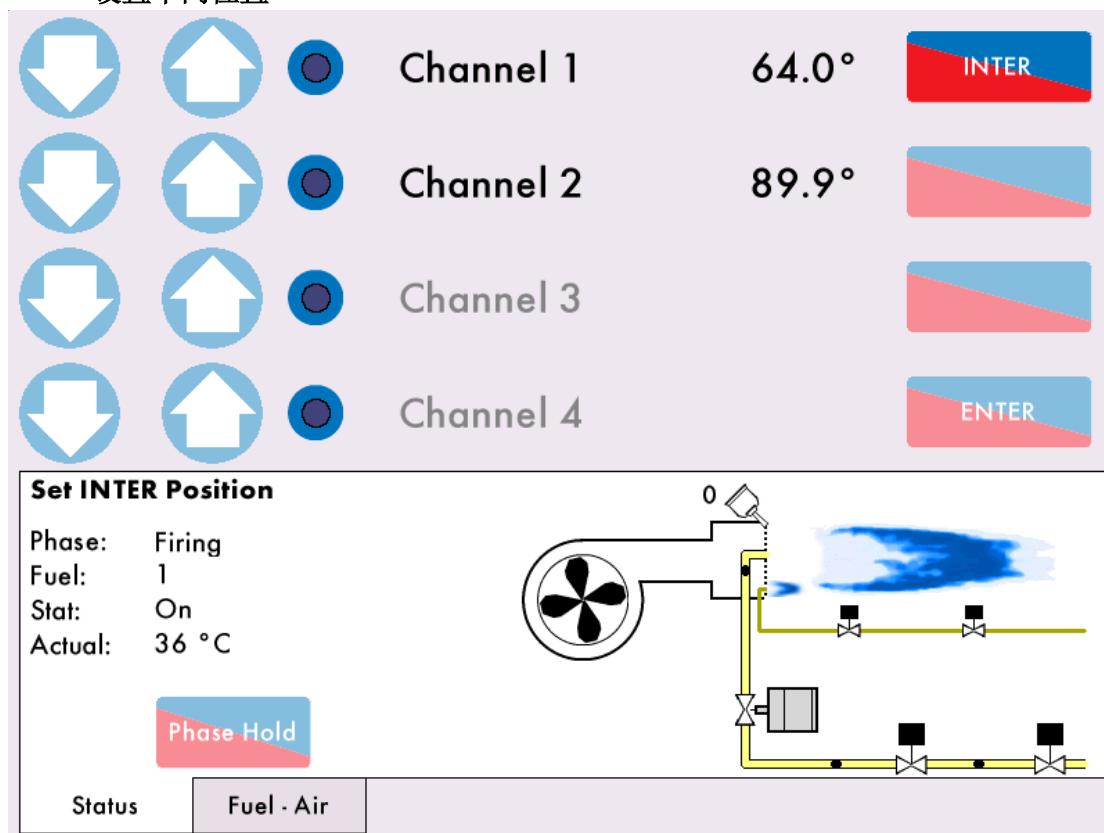


Figure 3.4.11.i Set INTER Position

设置中间位

Once the HIGH position has been entered, the message ‘Set INTER Position’ will appear. Press



to drive the servomotors (and VSD) to the first INTER position. There must be a



minimum of 0.5° gap between the positions entered on the fuel channel. Press



to store this INTER position.

在完成高火位置的输入后，控制模块屏幕将显示“设置中间位置”。按下 按钮并且将伺服马达（和变速驱动）打开到第一个中间位。在燃料频道上输入的各中间位置之间必须

至少有0.5°度的间隔。按下 按钮来保存中间位置。

There must be a minimum of 3 INTER points entered on the fuel-air curve, and a maximum of 18. Points can be added in Single Point Change mode (see section 3.6).

燃料 – 空气曲线上的中间位至少为3个，至多为18个。可以在单点更改模式下添加中间位（参见章节3.6）。

Continue this process until all the required INTER points have been entered.

继续设置中间位的操作，直到所需的中间位全部都被输入。

### 3.4.12 Set INTER or START Position

设置中间或启动位置

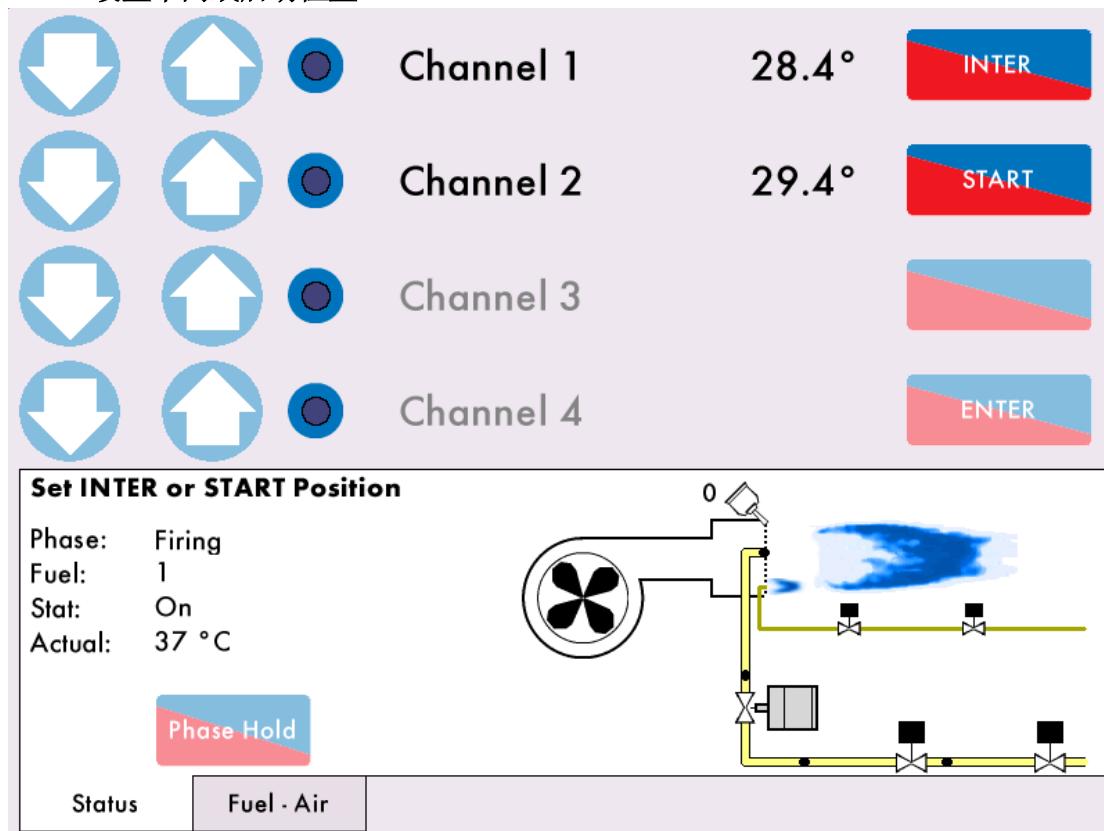


Figure 3.4.12.i Set INTER or START Position

设置中间或者启动位

Once the minimum 3 INTER points have been added, you will be prompted to either enter another INTER point or the START/LOW FIRE position.

在输入了3个中间位后，系统将询问“是否再添加一个新的中间位，还是添加启动/低火位置？”。

Press to drive the servomotors (and VSD) to the START/ LOW FIRE position, and then press to store this.

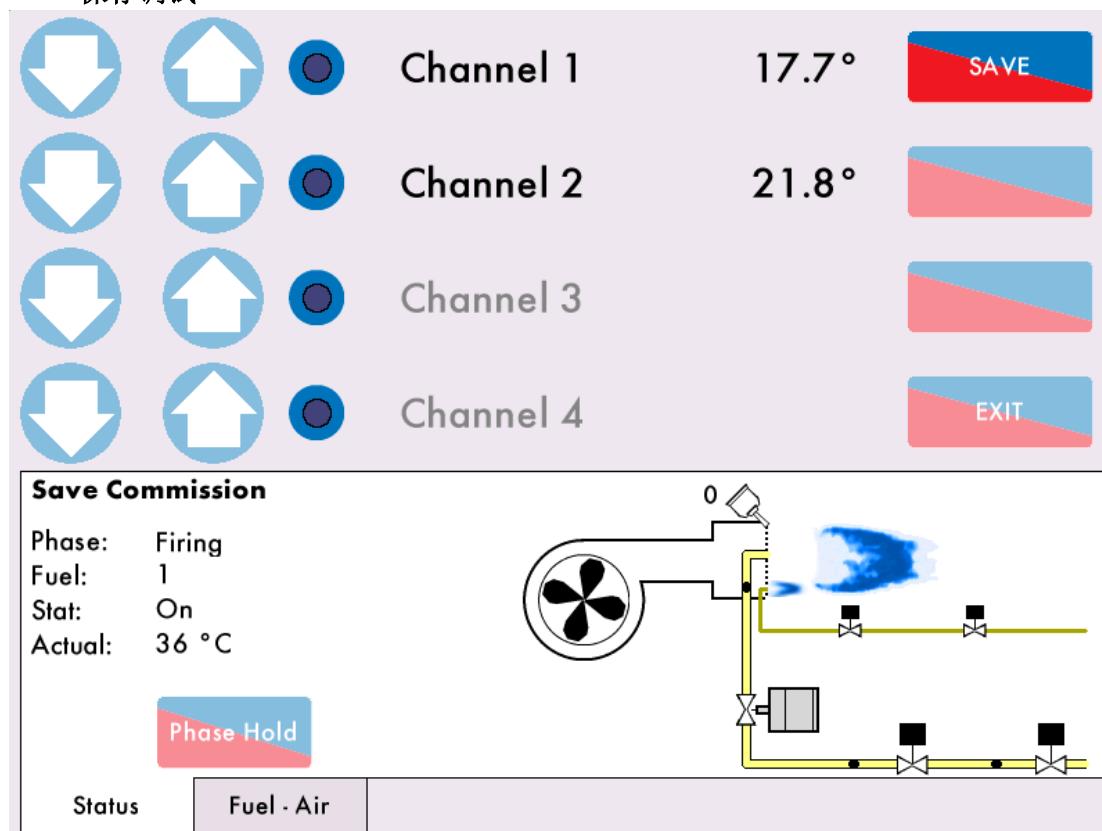
按下 按钮来将伺服马达（和变速驱动）打开到启动/低火位置，然后按下 来保存设置。

**Note:** If Golden Start or FGR Start are in use, the Start position is only used for Low Fire.

**注意：**如果系统启用“黄金启动”或者“烟气再循环”，那么启动位置仅用于低火位置。

### 3.4.13 Save Commission

保存调试



#### 3.4.13.i Save Commission

保存调试

Once the START position has been entered, press to store this commission curve. The message 'Commission Complete' will appear and press to go normal firing mode.

在输入启动位置后，按下 按钮来保存调试曲线。系统将显示“调试完成”，随后按下 按钮回到正常燃烧模式。

If the burner has been previously commissioned then the new saved curve will overwrite the previous data for the fuel selected. Failure to save the curve will result in the commissioning data not being stored within the unit and a power loss to the unit will result in a loss of data for the fuel selected.

如果燃烧器之前已被调试过，那么为新燃料设计和保存的曲线将取代已有的燃料曲线。不保存新燃料曲线会导致调试数据未保存在设备模块中，一旦发生设备断电所有调试数据就会丢失。

If during commissioning the burner turns off, due to the 'running interlock' opening or a lockout, it is possible to carry on commissioning from the last entered position, as long as the HIGH position has been entered, and the fuel selected is not changed. When the 'running interlock' is closed again, or the lockout is cleared, the system will purge automatically. Commissioning will then be resumed at the START position (section 3.4.4). The system automatically bypasses the HIGH position entry and resumes the commissioning procedure from the last entered INTER position.

如果在调试中由于“运行连锁”或者“系统锁定”造成燃烧器关闭，只要系统已经保存了高火位数值并且所选燃料未变，系统将从之前的中止位继续进行调试。当“运行连锁”的条件或者“系

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统锁定”被清除后，系统将自动吹扫。调试将从“启动位置”继续进行（章节3.4.4），然后系统将自动越过高火位的输入值并且从上次中止处的中间位继续进行调试。

Once the burner has been commissioned, the fuel flow metering will need to be entered, please go to section 3.5 Fuel Flow Commissioning. If there is E.G.A. trim data to be added then continue to section 3.7 Single Point Change before section 3.5 Fuel Flow Commissioning.

在完成燃烧器调试后，系统需要设置燃料流量计量数值，请参阅章节3.5“燃料流量调试”。如果系统启用E.G.A.调节，那么在进行章节3.5“燃料流量调试”之前要先进行章节3.7“单点更改”。

**Note:** If commissioning a fuel for the first time the default required setpoint will usually be lower than the actual temperature/ pressure causing the burner to shut down at commission completion.

**注意：**在首次调试某燃料时，默认设定值一般会低于实际温度/压力值，这会导致在系统调试完成时燃烧器的关闭。

### 3.5 Fuel Flow Commissioning

燃料流量调试

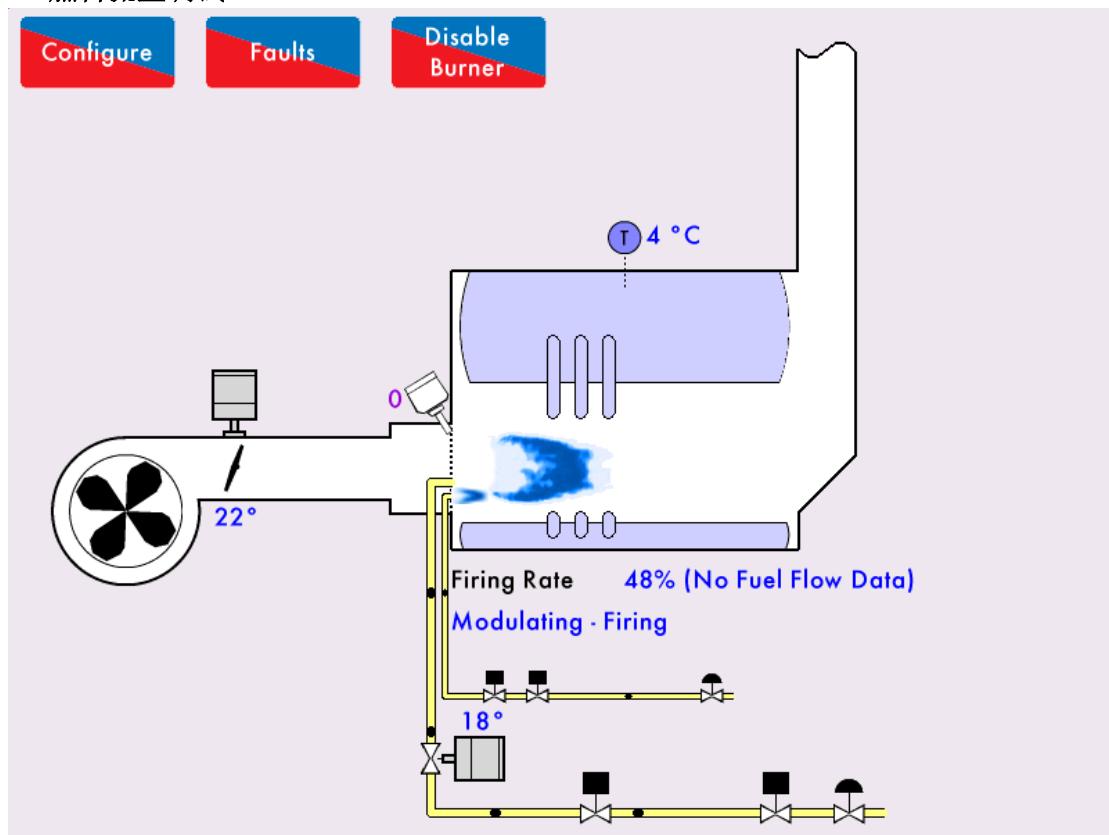


Figure 3.5.i Home Screen – No Fuel Flow Data

主页 – 没有燃料流量数据

Once the burner has been commissioned, fuel flow metering must be commissioned to calculate the firing rate. The fuel flow metering is used to rate the size of the burner and calculate the firing rate.

在完成燃烧器调试后，操作者必须要调试燃料流量表来计算燃烧率。燃料流量表数据被用来评定燃烧器规格和计算燃烧率。

If fuel flow metering is not commissioned and sequencing is optioned, then M.M. will assume a default burner rating which is based on the fractional fuel valve angle.

如果操作者还未调试过燃料流量表但是已启用了控制模块排序，那么控制模块将默认采用基于燃料阀门实际角度的燃烧器规格。

The fuel flow is commissioned from the high fire point down to low fire.  
燃料流量的调试过程是从高火位到低火位。

If a fuel flow meter is not being used and only arbitrary values are being used then make sure a good range of values are being used (e.g. 100 to 10) with equal spaces between the values. Not doing this could lead to problems when using IBS and the flame graphic.

如果不使用燃料流量表而是使用任意值数据，那么要确保使用一个足够大的数值范围（例如100到10）并且各数值之间要有相等间隔，否则在进行智能锅炉排序和生成火焰图形的过程中都会产生问题。

When using arbitrary values it is good practice to use the following calculation to determine the heat value for each of the 10 points.

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当使用任意值数据时，我们建议用以下方法来计算和设置10个点的热值。

$$Value\ Between\ Points = \frac{Burner\ Rating - \left( \frac{Burner\ Rating}{Turndown} \right)}{9}$$

For example: Burner Rating: 5.4MW; Turndown Ratio: 5:1.

例如：燃烧器规格： 5.4MW， 调节比： 5:1

$$\frac{5.4 - \left( \frac{5.4}{5} \right)}{9} = 0.48$$

Giving the range (5.40, 4.92, 4.44, 3.96, 3.48, 3.00, 2.52, 2.04, 1.56, 1.08)

根据燃烧器规格， 10个设定点应为(5.40, 4.92, 4.44, 3.96, 3.48, 3.00, 2.52, 2.04, 1.56, 1.08)

Fuel flow metering serves to totalise the amount of fuel being used at each position. If any changes are made to the curve through Single Point Change, then fuel flow will need to be re-commissioned.  
燃料流量表被用来计量各个设定位的燃料总用量。如果通过“单点更改”改变了燃烧曲线，那么必需重新调试燃料流量。

Fuel flow commissioning set by option 57, and is carried out in Run mode. The burner must be firing.  
在选项57中启用燃料流量表， 然后在系统运行模式下调试燃料流量表。这时燃烧器必须燃烧。

On the Home Screen, press  to access the System Configuration screen.

在控制模块主页上按下  按钮来进入系统配置屏幕。

# System Configuration

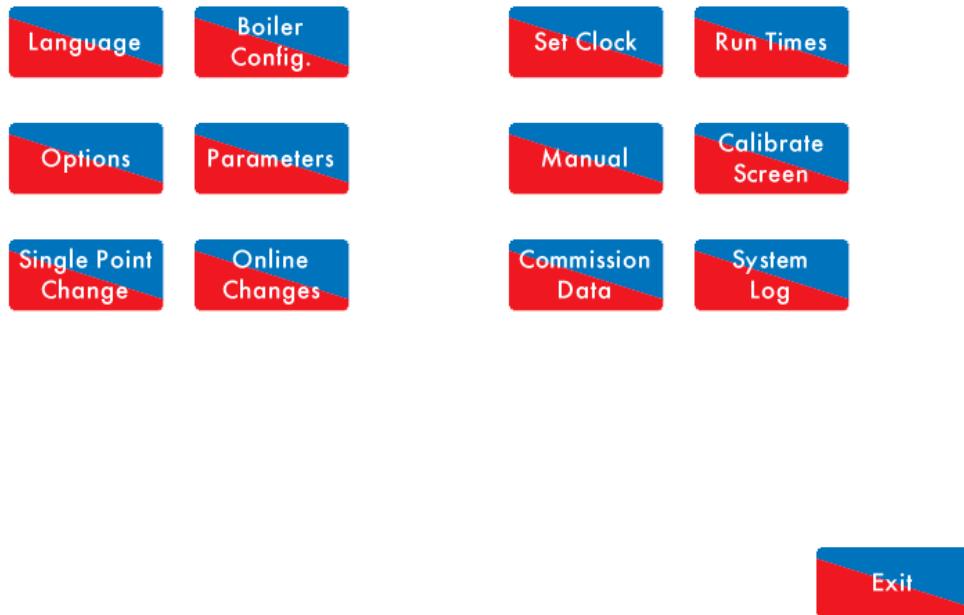


Figure 3.5.ii System Configuration Screen  
系统配置屏幕

On the System Configuration screen press **Online Changes**. You will be prompted to enter the Online Change passwords. Press **Continue** and **Exit** to access the Online Changes screen.

Press **Fuel-flow Commission**.

在系统配置屏幕上按下 **Online Changes** 按钮。屏幕将显示“输入在线更改密码”。按下 **Continue** 和 **Exit** 按钮来进入在线更改屏幕。按下 **Fuel-flow Commission** 按钮。

## Fuel Flow Commissioning

Fuel Channel Angle: 37.4 °

Heat Value: 0.00 MW

Point 1 of 10

			10
7	8	9	↑
4	5	6	
1	2	3	↓
C	0	.	

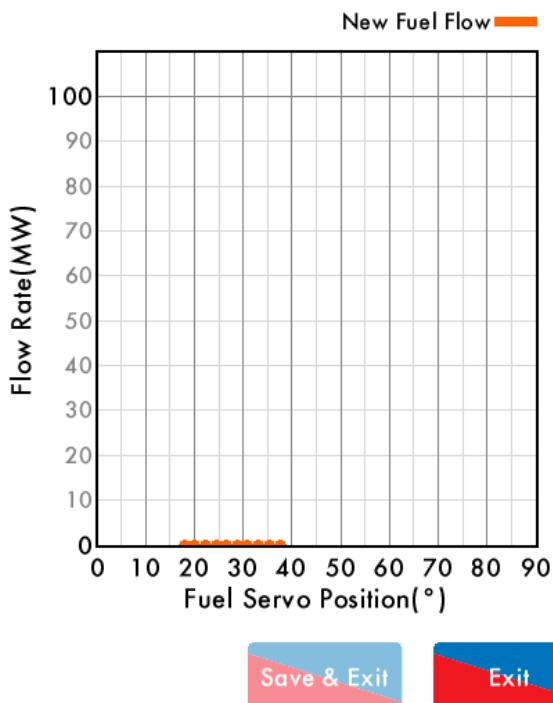


Figure 3.5.iii Fuel Flow Commissioning

燃料流量调试

There are 10 points which need to be entered across the commission curve from low fire to high fire, with high fire being point 1, and low fire point 10.

输入调试曲线上10个从低火到高火的设定位数值，最高火为点1，最低火为点10。

Type in the heat value or ‘dummy value’ using the keypad and press the return key to save that point.

用小键盘输入热值或“虚拟点”，按下回车键来保存数值。

**Note:** The servomotors will drive up to the high fire position, and then drive down as the fuel flow commissioning points are entered. Precautions must be taken to ensure that the boiler is warm enough for all 10 points to be entered.

**注意：**伺服马达首先将打开到高火位置，在输入燃料流量调试值时伺服马达将不断调低。请务必注意要在锅炉热态时输入10个设定点。

As you enter the heat values for the 10 points, these will become marked on the graph to the right of the screen.

在输入10个设定位的热值时，10个设定位将被标识在屏幕右侧的图片上。

Save & Exit

Once the fuel flow commissioning is complete, press to return to modulation in normal firing mode.

燃料流量调试完成后，按下 按钮回到正常燃烧模式下的控制。

 Exit

If you press  at any time during fuel flow commission, this will not store the points.

Exit

如果在调试燃料流量期间的任何时点按下  按钮，系统将丢失已设的数值。

### 3.5.1 Calorific Fuel Data

#### 燃料数据

Stats 参数	Kerosene SG 煤油	Gas Oil CI/SH 柴油	Light fuel Oil SG 轻油	Medium fuel Oil SG 中油	Heavy Fuel Oil SG 重油
Relative density 15.6°C (60°F) approx. 15.6°C(60°F)时的相对密度 / = litres x = kg	0.79	0.835	0.93	0.94	0.96
Flash point (closed) min °C (°F) 闪点°C (°F)	37.8 (100)	65.6 (150)	65.6 (150)	65.6 (150)	65.6 (150)
Viscosity kinematic (cSt) at 以下温度时的运动粘度 15.6°C (60°F) approx. 37.8°C (100°F) approx. 82.2°C (180°F) approx. Equivalent Redwood No.1 等效Redwood粘度	2.0	-	-	-	-
Viscosity at 37.8°C (100°F) 37.8°C (100°F)的黏度	-	3.0	-	-	-
Freezing point °C / °F 冰点	Below -40	Below -40	Below -40	Below -40	Below -40
Cloud point °C max 浊点	-	-2.2	-	-	-
Gross calorific values 总热值	46,520	45,590	43,496	43,030	42,800
KJ/kg approx.	20,000	19,600	18,700	18,500	18,400
Btu/lb approx.	10.18	10.57	11.28	11.22	11.42
KWh/litre approx.	1.58	1.64	1.75	1.74	1.77
Therms/gallon approx. kW/kg	-	12.66	12.08	-	11.89
Sulphur content % wt. 氮含量	0.2	0.6	2.3	2.4	2.5
Water content % vol. 水分	Negligible 可不计	0.05	0.10	0.20	0.30
Sediment content % wt 含沙量	-	Negligible 可不计	0.20	0.03	0.04
Ash content % wt 含灰量	-	Negligible 可不计	0.02	0.03	0.04
Mean specific heat between 0°C - 100°C approx. 0°C - 100°C之间的平均比	0.50	0.49	0.46	0.45	0.45

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热					
Volume correction factor per 1°C 每摄氏度的体积校正系数	0.00083	0.00083	0.0007	0.0007	0.00068
Volume correction factor per 1°F 每华氏度的体积校正系数	0.00046	0.00046	0.00039	0.00039	0.00038
Btu/U.S. gallon (US standard) 英国热量单位/美国加仑 (美国标准)	-	140,000	-	150,000	160,000
Lb/U.S. gallon (US standard) 每磅/美国加仑 (美国标准)	-	7.01	-	-	7.01
% lighter than water 轻于水的百分比		20%			4%
1 u.s. Gallon of oil / ft of air 1美国加仑的油/每英尺空 气		1402			

### 3.5.2 Conversion Factor for Imperial Gas Flow Meters

#### 英制燃气流量表的换算因子

Required Data:	Pressure of gas at meter in "wg 所需数据: 在流量计处的燃气压力, 单位"wg
Calculations:	Correction factor = (pressure of gas at meter x 0.00228 ) + 0.948 计算: 校正系数 = (在流量计处的燃气压力 x 0.00228) + 0.948
	Reading on gas meter = required gas flow / correction factor 燃气表读数 = 所需燃气流量 / 校正系数
Example:	Pressure of gas at meter = 58" wg 例子: 在流量计处的燃气压力 = 58" wg
	Required gas flow = 95 ft³/min 所需燃气流量 = 95 立方英尺/分钟
	Conversion factor = (58 x 0.00228) + 0.948 = 1.08 换算因子 = (58 x 0.00228) + 0.948 = 1.08
	Reading on Meter = 95 / 1.08 = 88 ft³/min 燃气表读数 = 95 / 1.08 = 88 ft³/min

### 3.5.3 Correction Factor for Burners Significantly Above Sea Level

#### 较高海拔处燃烧器运行的校正系数

Note: Above sea level i.e. >200m (1ft = 0.3048m)

注: 较高海拔处, 即>200米 (1英尺 = 0.3048米)

Height above sea level in meters, Calculation for correction factor: =  
海拔高度 (米), 校正系数的计算: =

(Pressure of gas at meter x 0.00228) + (0.948 – (height above sea level x 0.0001075))  
(在流量计处的燃气压力x 0.00228) + (0.948 – (海拔高度 x 0.0001075))

Example: As above but 250 m above sea level:  
 例子: 沿用上例的燃气压力, 海拔高度是250m  
 $\text{Correction factor} = (58 \times 0.00228) + (0.948 - (250 \times 0.0001075)) = 1.05$   
 校正系数 =  $(58 \times 0.00228) + (0.948 - (250 \times 0.0001075)) = 1.05$

### 3.5.4 Gas Volume Conversion Factors

#### 燃气体积换算因数

Assumed gas temperature 假设燃气温	10 °C	50 °F
Standard pressure 标准压力	e 760 mmHg e 760 毫米汞柱	101.3612 Kpa 101.3612 千帕
Standard temperature 标准温度	15.56 °C	
Ambient pressure 环境压力	101.325 Kpa 101.325 千帕	

Wg "	PSI PSI	mmH2O 毫米水 柱	mmHg 毫米汞 柱	Kpa 千帕	mBar 毫巴	Conversion factor 转换因子
1	0.036	25.4	1.867	0.249	2.49	1.0218
2	0.072	50.8	3.734	0.498	4.98	1.0243
3	0.108	76.2	5.601	0.747	7.47	1.0268
4	0.144	101.6	7.468	0.996	9.96	1.0293
5	0.181	127	9.335	1.245	12.451	1.0318
6	0.217	152.4	11.202	1.494	14.941	1.0343
7	0.253	177.8	13.069	1.743	17.431	1.0368
8	0.289	203.2	14.936	1.993	19.921	1.0393
9	0.325	228.6	16.804	2.242	22.411	1.0418
10	0.361	254	18.671	2.491	24.901	1.0443
15	0.542	381	28.006	3.736	37.352	1.0569
20	0.722	508	37.341	4.981	49.802	1.0694
25	0.903	635	46.677	6.227	62.253	1.0819
30	1.083	762	56.012	7.472	74.703	1.0944
35	1.264	889	65.347	8.717	87.154	1.107
40	1.444	1016	74.682	9.963	99.604	1.1195
45	1.625	1143	84.018	11.208	112.055	1.132
50	1.805	1270	93.353	12.453	124.505	1.1445
55	1.986	1397	102.688	13.699	136.956	1.1571
60	2.166	1524	112.024	14.944	149.406	1.1696
65	2.347	1651	121.359	16.189	161.857	1.1821
70	2.527	1778	130.694	17.435	174.307	1.1947
75	2.708	1905	140.03	18.68	186.758	1.2072
80	2.889	2032	149.365	19.925	199.208	1.2197
85	3.069	2159	158.7	21.171	211.659	1.2322
90	3.25	2286	168.035	22.416	224.109	1.2448
95	3.43	2413	177.371	23.661	236.56	1.2573
100	3.611	2540	186.706	24.907	249.01	1.2698
110	3.972	2794	205.377	27.397	273.911	1.2949
120	4.333	3048	224.047	29.888	298.812	1.3199
130	4.694	3302	242.718	32.379	323.713	1.345
140	5.055	3556	261.388	34.869	348.614	1.37

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150	5.416	3810	280.059	37.36	373.515	1.3951
160	5.777	4064	298.73	39.851	398.416	1.4201
170	6.138	4318	317.4	42.341	423.317	1.4452
180	6.499	4572	336.071	44.832	448.218	1.4703
190	6.86	4826	354.741	47.323	473.119	1.4953
200	7.221	5080	373.412	49.813	498.02	1.5204

How to use this information:-

如何使用这些信息： -

1. Measure Volumetric flow of gas for 1min in ft3 (i.e. ft3/min). Note 1m3 = 35.31ft3

测量1立方英尺内1分钟燃气体积流量（即：1立方英尺/分钟）。注：1立方米 = 35.31立方英尺

2. Multiply this volume flow by 60 to give volumetric flow per hour (i.e. ft3/hr).

将1分钟燃气体积流量乘以60得出1小时燃气体积流量（即：立方英尺/小时）

3. Measure the pressure of the gas supply.

测量供气压力。

4. Use the table above to obtain a conversion factor.

使用上表获得转换因子

5. Multiply the volume flow per hour by the conversion factor to obtain a volume at reference conditions.

将1小时燃气体积流量乘以转换因子得出参考条件下的体积流量数值。

6. For natural gas, the calorific value is typically 1000 Btu/ft3. To obtain the firing rate of the boiler at standard reference conditions multiply the volume at reference conditions by 1000.

天然气热值通常是1000 英国热量单位/立方英尺。将参考条件下的体积流量值乘以1000可得出标准参考条件下的锅炉燃烧率。

Represented as an equation:-

以公式表示： -

Firing rate = (Measured Volumetric flow per minute x 60 x Conversion factor x 1000) Btu/hr

燃烧率 = (1分钟燃气体积流量 x 60 x 转换因子 x 1000) 英国热量单位/小时

### 3.6 Gas/ Air Pressure Commission

燃气/空气压力调试

To re-commission the gas pressure sensor, go to Commission Mode and press  . The M.M. will then run through the points to store the gas pressure values.

要重新调试燃气压力感应器，操作者需要进入调试模式并按下  按钮。控制模块将浏览各设定位和保存燃气压力数值。

If the VPS is optioned on, the unit will run through this process. The M.M. will go from Low Fire to High Fire and store the gas pressure values along the curve. Once these values are stored, the upper and lower offset limits will be adjusted to the new commissioned gas pressure values.

当系统启用了VPS（阀门校验系统），控制模块要执行本步骤。控制模块将从低火位到高火位浏览燃烧曲线和保存各燃气压力数值。在保存好这些数值后，系统将根据新的燃料压力调试数值来调节最高补偿值极限和最低补偿值极限。

If the burner turns off during the gas/air pressure commission, the gas/air pressure commission process will be restarted. This ensures that the M.M. does not run with an incomplete set of gas/air pressure readings.

如果燃烧器在燃气/空气压力调试期间关闭，燃气/空气压力调试将重新开始。这是为了确保在控制模块运行时燃气/空气压力读数的完整。

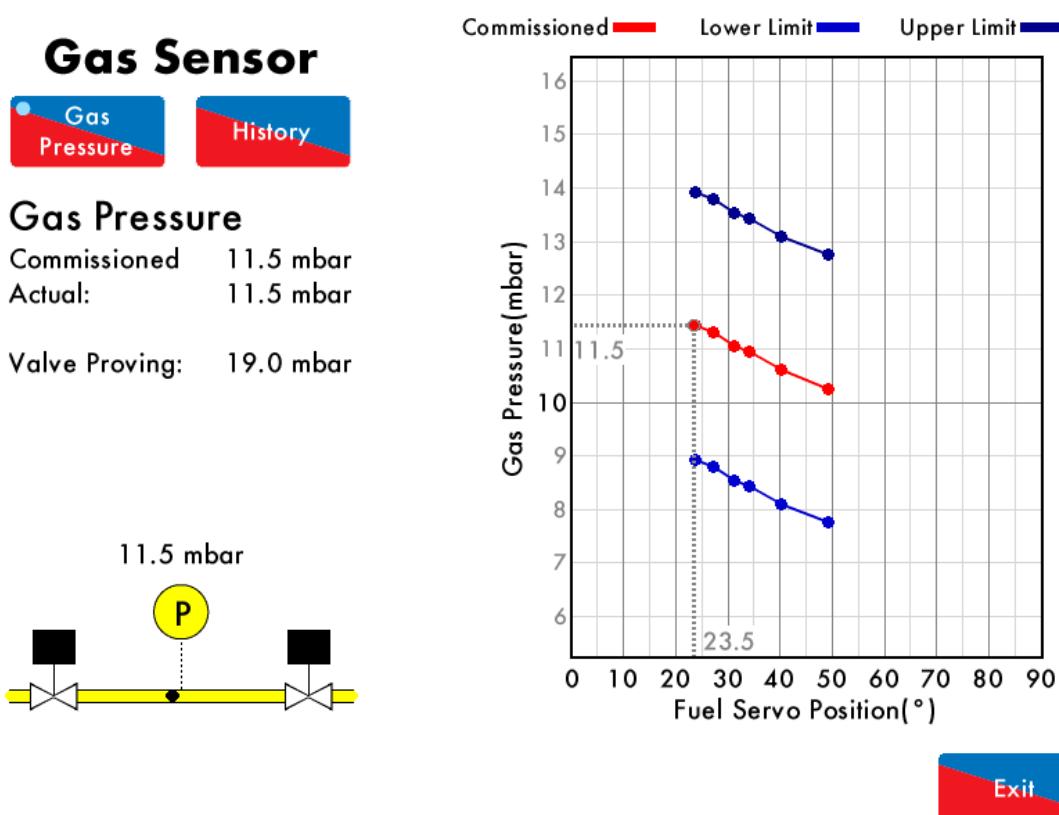


Figure 3.6.i Gas Sensor – Low Fire  
燃气感应器 - 低火位

To commission the air pressure sensor, in Commission Mode screen press  to commission the air pressure sensor.

在调试模式屏幕上按下 **Air Pressure Commission** 按钮来调试空气压力感应器。

### 3.7 Single Point Change

单点更改

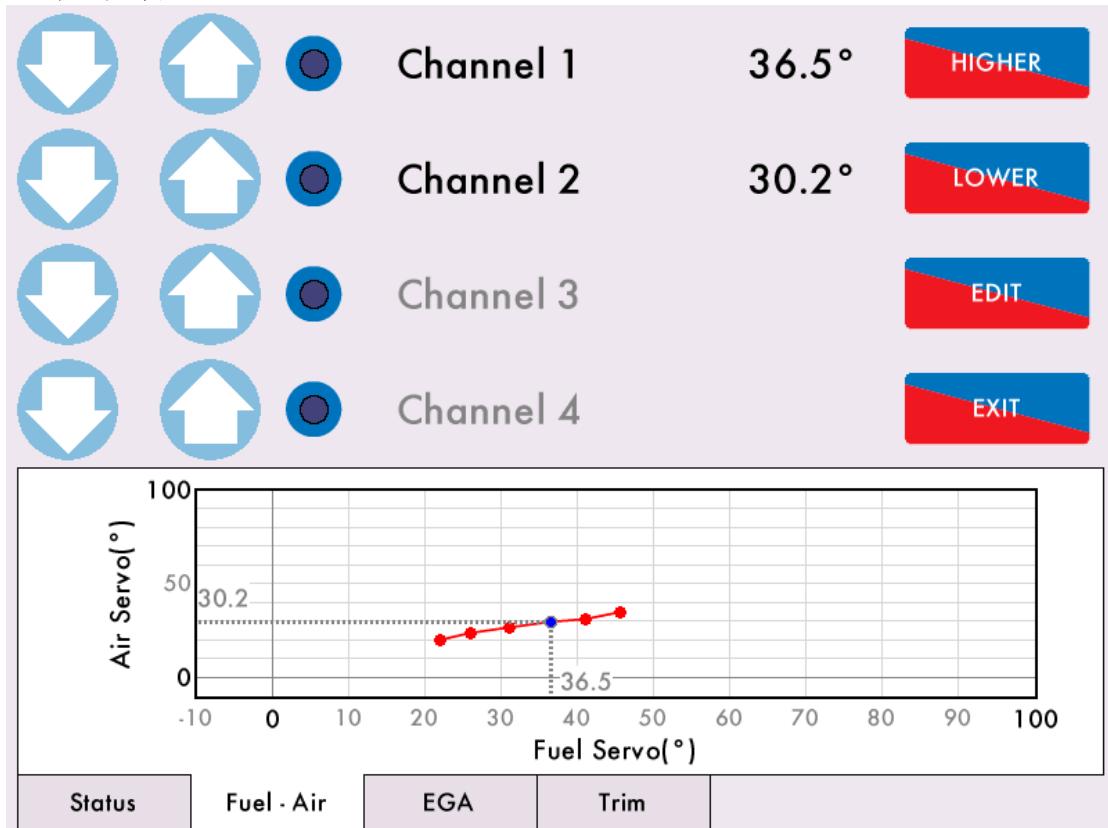


Figure 3.7.i Single Point Change  
单点更改

Press **Single Point Change** in the system configuration screen and enter the password to access Single Point Change mode.

在系统配置屏幕上按下 **Single Point Change** 按钮，输入口令来进入单点更改模式。

Select the point to be edited or added trim to by pressing **HIGHER** or **LOWER** to go up and down the fuel curve. Then press **EDIT**.

按下 **HIGHER** (往上) 按钮或者 **LOWER** (往下) 按钮来选择燃料曲线上需要编辑或添加 EGA 调节操作的设定位。选定后按下 **EDIT** (编辑) 按钮。

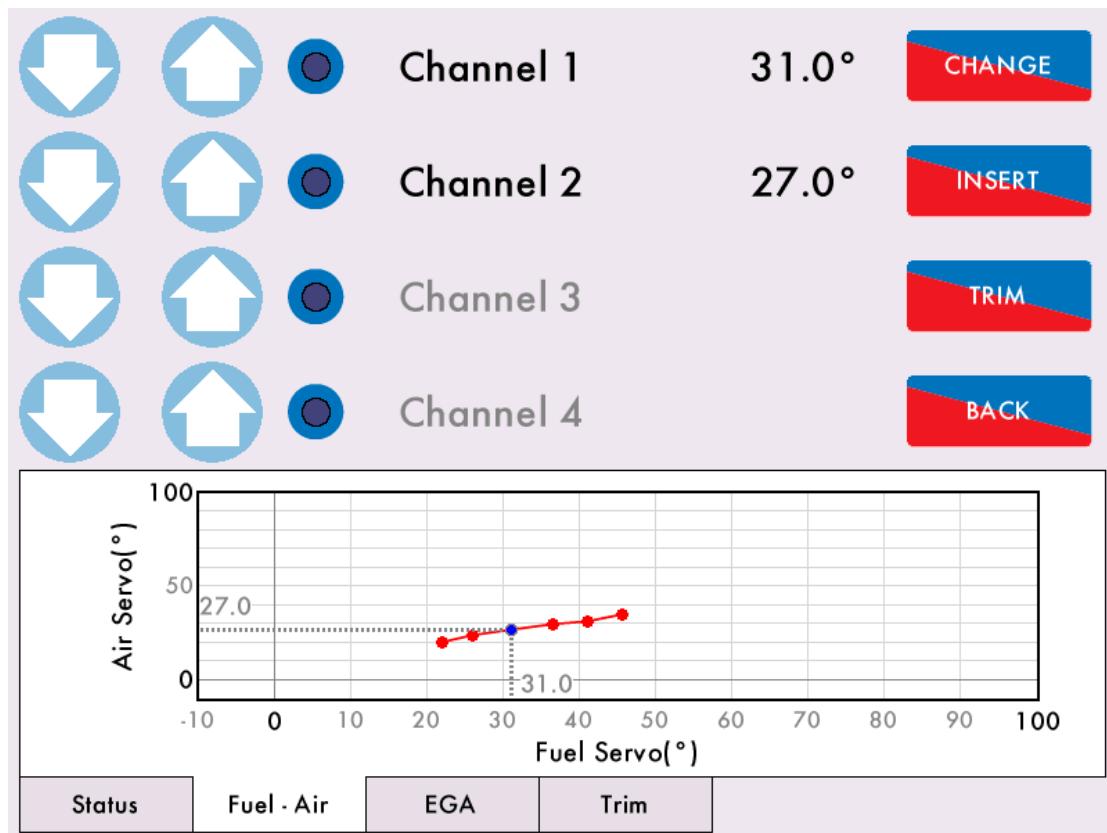


Figure 3.7.ii Changes

更改

To edit a previously entered point press **CHANGE** and make adjustments to the positions as needed (see Figure 3.7.iii).

要编辑已有设定位，按下 **CHANGE** 按钮然后根据需要来更改设定位数值。(参见图示3.7.iii)

To enter a new point press **INSERT**.

要添加一新设定位，按下 **INSERT**。

To add trim data to a point press **TRIM**, see section 3.4.6 and Figure 3.7.iv.

要向一设定位添加EGA调节操作，按下 **TRIM**，参阅章节3.4.6和图示3.7. iv.

**Note:** It is not possible to delete LOW or HIGH FIRE positions or have less than 3 INTER points.

注意：低火位或者高火位是无法删除的。中间位设定点数量至少是3。

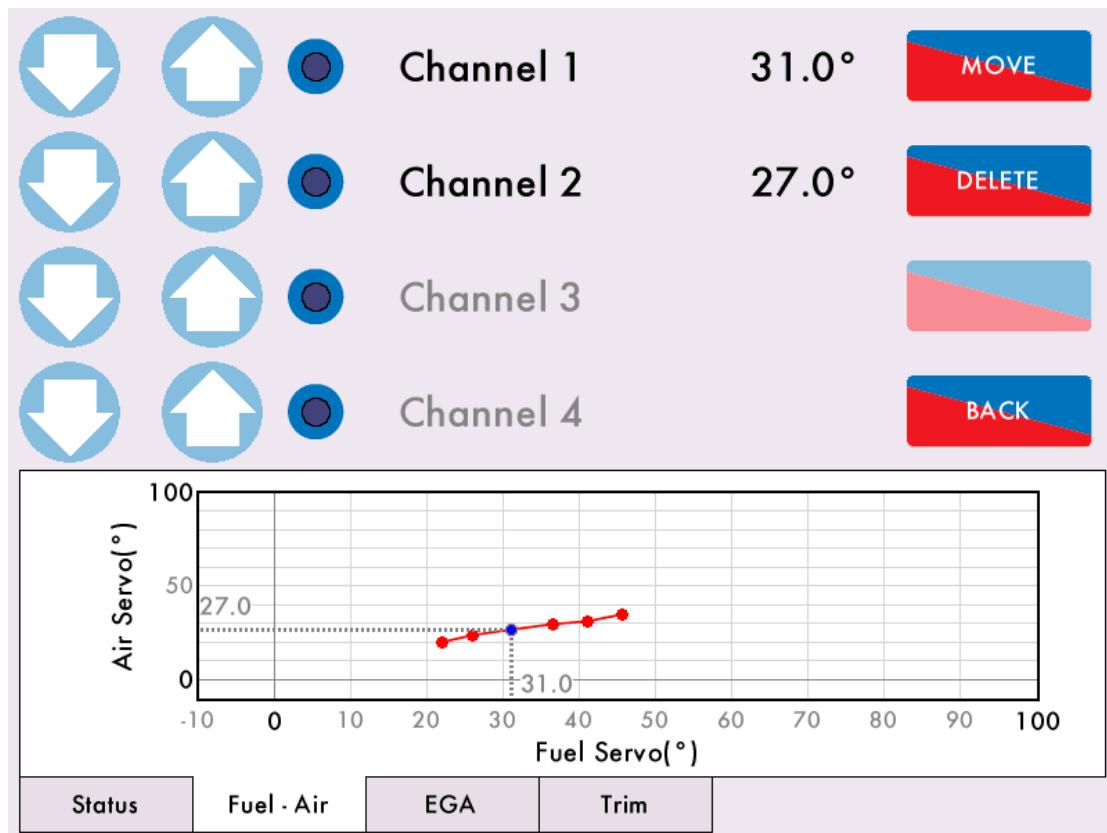


Figure 3.7.iii Changing a Point

更改设定位数值

Press to the fuel, air and/or VSD commissioned value of that point. Once the

changes have been made, press to save this position. If a point is overwritten, the trim data is cleared.

按下 来找到设定位的燃料, 空气和/或变速驱动调试值。在完成设定位数值的更改后, 按下 按钮来保存更改。如果某设定位被重写, 该设定位的EGA调节数据将被清除。

Press to remove the point; there must be a minimum of 3 INTER points.

按下 按钮可删除设定位。系统必须要有至少3个中间位置设定位。



Figure 3.7.iv Single Point Change – Trim

单点更改 – EGA 调节操作

The M.M. will store the trim values for this position.

控制模块将保存设定位的EGA调节数据。

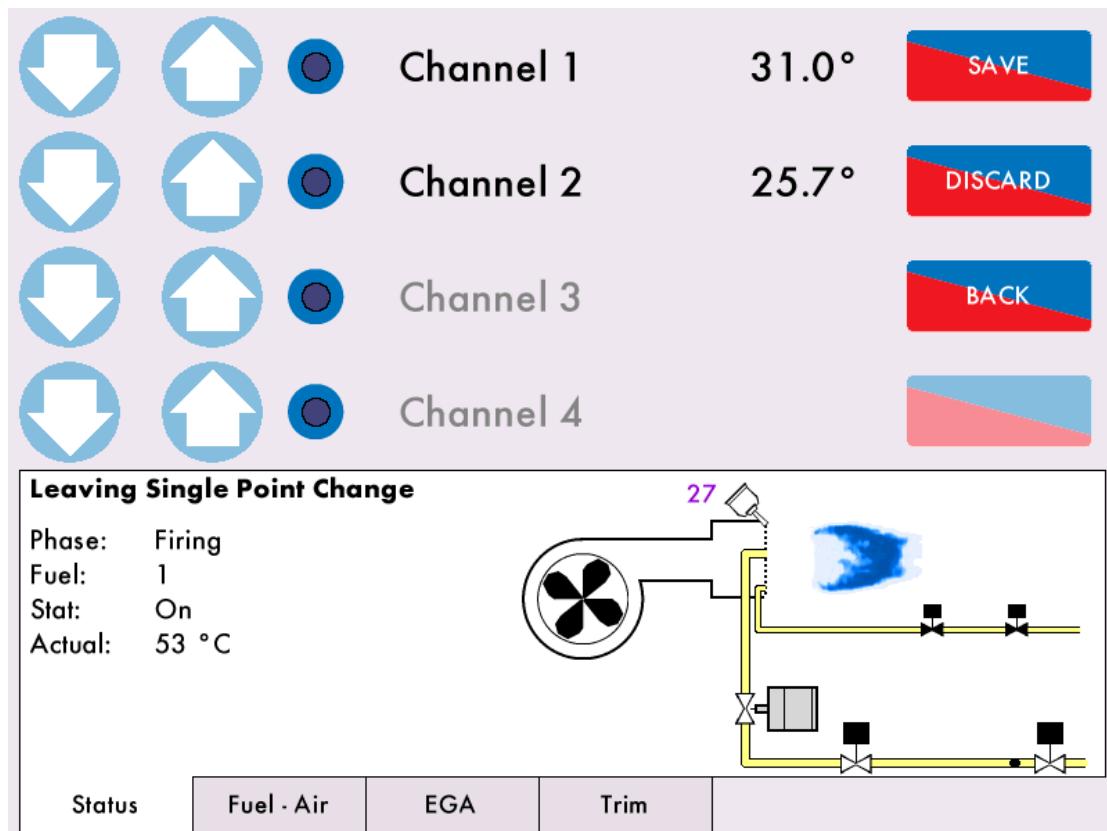


Figure 3.7.v Exit Single Point Change

退出单点更改

Once the adjustments have been made, go back to the Single Point Change home screen Figure 3.7.i

and press .

在完成数据调节后，回到单点更改主页屏幕（图示3.7.i）并按下  按钮。

Press  to leave Single Point Change mode.

按下  按钮来退出单点更改模式。

The fuel flow commissioning must be entered (again) if the following changes are made in single point change

如果操作者用“单点更改”做了以下操作，那么就必须进入燃料流量调试流程（再次）。

- HIGH or START position is changed.  
更改高火位置或启动位置
- E.G.A. trim data has been added.  
添加E.G.A.调节数据
- Points have been added.  
添加设定位

Please go to section 3.5 Fuel Flow Commissioning.

请参阅章节3.5燃料流量调试

### 3.8 Online Changes

线上更改

## Online Changes

### Settings



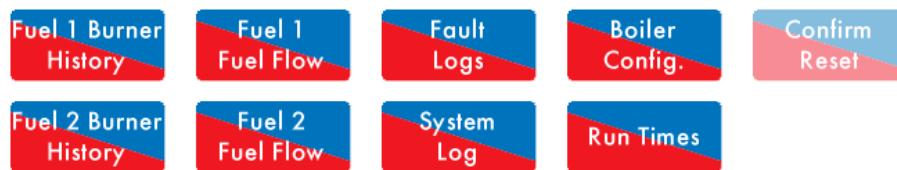
### Restart MM



### Commission



### Reset



Exit

Figure 3.8.i Online Changes Screen

线上更改屏幕

Online  
Changes

The Online Changes is accessed by pressing on the system configuration screen, and then entering the password. The Online Changes feature allows the following:

Online  
Changes

在系统配置屏幕上按下 按钮并且输入口令进入线上更改模式。在线上更改模式下可做下列操作：

- Fuel flow commissioning (section 3.5)  
燃料流量调试（章节3.5）
- Change non-safety critical options and parameters  
更改无重大安全意义的选项和参数设置
- Reset burner history  
重置燃烧器历史数据
- Reset fuel flow data  
重置燃料流量数据
- Reset fault logs  
重置故障记录日志
- Reset system log  
重置系统日志
- Reset boiler configuration  
重置锅炉配置
- Reset run times

## 重置运行时间记录

- Restart M.M. if the burner is in standby  
如果燃烧器处于待机，重启控制模块

Press on  or  to change the settings. For the Reset function, press the  data to be reset e.g. .

Press on  while the burner is in standby to restart the M.M.

按下  按钮或者  按钮来更改选项/参数的设置。对于重置功能，按下需要重置的数据按钮，例如  (燃料1燃烧器历史数据)，然后按下  (确认重置) 按钮。

当燃烧器待机时按下  按钮来重启控制模块。

### 3.9 General Operation

一般操作

#### 3.9.1 Calibrating the Actual Value

校正实际数值

To calibrate the actual value, a new parameter has been added to allow the temperature/ pressure sensor to be adjusted. Parameter 29 allows you to adjust the actual value between a range of 80.0% and 120.0%.

要校正实际数值，操作者可通过参数29来调节温度/压力感应器读数。参数29的实际数值调节范围是80%到120%。

The load sensor can be calibrated via Commissioning Mode or through Online Changes.

操作者在调试模式或者线上更改模式下可以校正荷载感应器。

**Note:** The percentage change may not be linear to the current temperature/ pressure, i.e 80% of 100°C may not show 80°C.

**注意：**百分比更改值并不和当前温度/压力值成线性关系，即100度的80%并不一定显示80度。

For example, if the actual temperature was showing as 91degC on the M.M., but the true temperature was 79degC, change the value in parameter 29 until the correct temperature adjustment has been made. Figure 3.9.1.i shows the load sensor adjusted by 96.0% to display 79degC.

例子，如果控制模块屏幕显示的实际温度是91度但是真实温度是79度，那么操作者可以调节参数29的数值直到屏幕上显示正确的数值。图示3.9.1是通过更改96%的读数来将荷载感应器读数调节到79度。

#### Online Changes

Options

Parameters

#### Parameter 29

#### Load Sensor Adjustment

96.0% (79 °C)

#### Modify Parameter

Value: 960



Range: 800 - 1200. Default setting: 1000.



Figure 3.9.1.i Load Sensor Adjusted  
调整后的荷载感应器

### 3.9.2 External Modulation

#### 外部控制

For external modulation, option 45 must be set to 1 Enabled, and option 9 must be set to 0. The internal PID control is disabled and the firing rate is set by input control signal on terminal 37, 38 as appropriate for 0 – 10V and 2 – 10V. Set parameters 68 for the external modulation control range, and parameter 69 for the input range. The fuel flow metering must be commissioned through option.

要使用外部控制，选项45的数值必须是1(启用)并且选项9的值必须是0。这时内部PID控制被关闭，燃烧率由终端37, 38上输入的0 – 10V和2 – 10V控制信号来设定。选项68设定外部调节控制范围，选项69设定外部控制的输入信号范围。操作者使用外部控制必须要通过选项来调试燃料计量表。

**Note:** 4-20mA external modulation can be used via a 500 ohm resistor across terminals 37 and 38.

**注意：**系统可以通过一个跨接终端37, 38的500欧姆电阻来使用外部控制的4 - 20mA电流输入。

### 3.9.3 Additional Functions

#### 额外功能

Options/ parameters 154, 155 and 156 have been added to set the function of terminals 80, 81 and 82, respectively. Terminal 80 is used for start position interlock, night setback input, and reduced setpoint input. Terminal 81 is used for purge interlock and low flame hold input. Terminal 82 is used for warming stat and valve proving mains input. Proving valves (end switch) provide a secondary confirmation that a valve has reached a predefined position.

选项/参数154, 155和156分别设置终端80, 81和82的功能。终端80用于“启动位置连锁”，“夜间调低值输入”和“降低设定点值输入”。终端81用于“吹扫连锁”和“低火焰输入”。终端82用于“加温控制点”和“阀门校验干线输入”。校验阀门（终端开关）的作用是二次确认阀门是否达到预定位置。

#### To install the End Limit Switches,

安装终端限位开关的方法，

1. Mount the servomotor onto the valve and ensure the potentiometer reads the correct position on the M.M. for the “CLOSED” and “OPEN” valve positions.  
将伺服马达安装到阀门上，确保屏幕上的电位计读数能正确反映阀门的“关闭”和“开启”位置。
2. Mount the End Switch Proving Unit (E.S.P.U.). The servomotor may have to be moved to a suitable position in order to allow the E.S.P.U. to be attached to the valve.  
安装终端开关校验设备(E.S.P.U.)。为了将终端开关校验设备装到阀门上，伺服马达可能要打开到一个合适位置。
3. Undo the End Limit Switch holding screws.  
解开终端限位开关的紧固螺丝。
4. Adjust the position of CAM corresponding to switches 1 (S1) and 2 (S2) by loosening the CAM screws and move to the required position.  
松开凸轮螺丝并且调节到位，根据开关1 (S1)和开关2 (S2)调节凸轮位置。
5. Wire the ESPU according to the Valve Proving the End Limit Switch will be required to provide. See the End Limit Switch wiring diagram in Figure 3.9.3.i  
根据阀门校验需要来接入终端开关校对设备(E.S.P.U.)。参见图示3.9.3.i中的终端限位开关接线图。

**Note:** The use of these switches is determined by the application approval necessary. These are not required to meet UL, FM or CE.

**注意：**开关的使用取决于实际的申请批复情况。这些开关不必符合UL, FM或者CE标准。

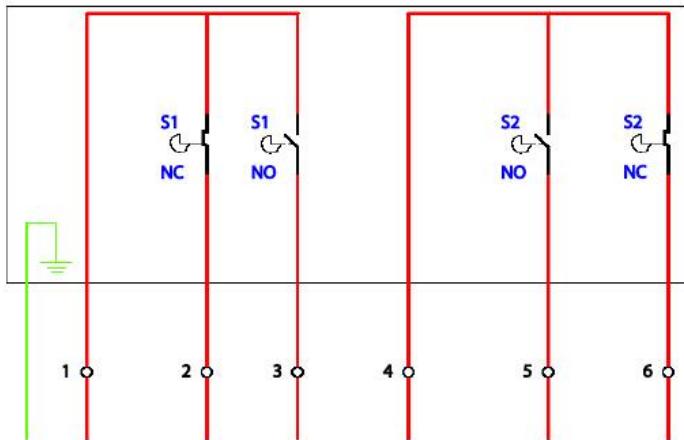


Figure 3.9.3.i End Switch Wiring Schematic

终端开关配线图

End Limit Switches are mounted on the end of bespoke valves (please contact Autoflame regarding bespoke valve manufacture) which are attached to the air and fuel valve and commissioned depending on the use of the End Limit Switches. An End Limit Switch comprises of two switches, as shown in Figure 3.9.3.i. Each comprises of an Earth and 6 connections to be wired as appropriate. The switches S1 and S2 are setup as per on site specification. These are then wired into either or both of the terminals 80, the start position interlock, and terminal 81 purge interlock.

终端限位开关被安装在定制阀门的端部（关于定制阀门的制造，请联系Autoflame）。根据终端限位开关的使用情况，定制阀门被安装在空气阀门以及燃料阀门上并且已经过调试。一个终端限位开关由两个开关组成（如图3.9.3.i所示），每个单开关由一根地线和6个接线接口组成。开关S1和S2的设置要根据现场规范，然后开关S1和S2将被接入终端80（启动位置连锁）和终端81（吹扫连锁）中的一个或者两个。

If option/ parameter 154 is set to 1, then the M.M. waits at RUN TO IGNITION until this interlock is made on terminal 80. If option/ parameter 155 is set to 1 then M.M. waits at RUN TO PURGE until this interlock is made on terminal 81.

如果选项/参数154被设为1，那么控制模块将停留在“运行到点火”处直到终端80上的启动位置连锁结束。如果选项/参数155被设为1，那么控制模块将停留在“运行到吹扫”处直到终端81上的吹扫连锁结束。

If option/ parameter 154 is set to 2, terminal 80 is the night setback input (night setback offset must be set in option 85). If it is set to 3, terminal 80 is used for reduced setpoint input. If option/ parameter 155 is set to 2, terminal 81 is used for the low flame hold input. If option/ parameter 156 is set to 0, than terminal 82 is used for the warming stat for sequencing. If it is set to 1, terminal 82 is used for the valve proving mains input (see option/ parameter 128).

如果选项/参数154被设为2，那么终端80将被用作“夜间调低值输入”（选项85是夜间调低补偿值）。如果选项/参数154被设为3，那么终端80被用作“降低设定点值输入”。如果选项/参数155被设为2，那么终端81将被用作“低火焰保持信号输入”。如果选项/参数156被设为0，那么终端82将被用作“排序过程中加温控制点的输入”。如果选项/参数156被设为1，终端82将被用作“阀门校验，干线信号的输入”（参见选项/参数128）。

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## 4 REMOTE CONTROL

### 远程控制

#### 4.1 Modbus Settings

##### Modbus 设置

There are a limited number of Modbus addresses available in the Mini Mk8 M.M., which can be accessed directly without the need for a D.T.I.

Mk8 微型控制模块带有数个 Modbus 地址。操作者无需通过 D.T.I. 就能直接使用这些 Modbus 地址。

When using Modbus direct, e.g. connecting to Building Management System from the M.M. without a D.T.I., then neither Autoflame Intelligent Boiler Sequencing nor the D.T.I. can be used.

当直接使用 Modbus 时(比如当用户不通过 D.T.I. 将控制模块连接到楼宇管理系统时), Autoflame 智能锅炉排序和 D.T.I. 都不能使用。

The Mini Mk8 M.M. communicates using an RS485 data link from terminals 27 (-ve) and 28 (+ve). Belden 9501 data cable is recommended.

Mk8 微型控制模块使用接线端子 27 (-ve) 和 28 (+ve) 上的 RS485 数据线来进行通讯。建议使用 Belden 9501 数据线。

Up to 10 Mini Mk8 M.M.s can be linked to together and connected to a Building Management System via terminals 27 and 28. Each Mini Mk8 M.M. will need to be set with an individual Modbus device ID by setting option 104.

最多可将 10 个 Mk8 微型控制模块连接起来, 然后通过接线端子 27 和 28 与楼宇管理系统连接。操作者可通过选项 104 来设置每台 Mk8 微型控制模块的 Modbus 设备标识号。

The maximum block of addresses the Mini Mk8 M.M. can read and write to is 127, as per Modbus having a built-in limit of 255 byte packets.

Mk8 微型控制模块能读写的最大地址块数量是 127, Modbus 的内置极限是 255 个字节包。

If the Mini Mk8 M.M. does not receive any Modbus commands for 60 seconds, the Modbus goes “offline.” You can keep the Modbus “online” with a simple instruction, such as polling or setting a single value to that individual M.M. If the Modbus is “offline” then remote setpoint and firing set via Modbus will be disabled. The only exception is the enable/ disable burner which changes the enable/ disable button on the M.M. home screen, as this change will last until the Modbus state is changed again or the enable/ disable button is pressed again.

如果 Mk8 微型控制模块超过 60 秒未收到 Modbus 指令, Modbus 将“下线”。用户可以发出简单指令来保持 Modbus 的“在线”, 例如对控制模块进行简单问询或者单值设置。如果 Modbus 处于“下线”状态, 用户不能利用 Modbus 来远程设置数值和燃烧率。在 Modbus 失联后仍可以用控制模块主页上的按钮来启动/停止燃烧器。在 Modbus 通讯恢复后从 Modbus 地址发出的启动/停止燃烧器的命令要优先于主页上燃烧器启动/停止按钮的操作。

If the M.M. is powered off or the comms is lost, the Modbus address values from the unit will not be true.

如果控制模块断电或者通信中断, 控制模块会发出错误的 Modbus 地址数据。

Please see next page for Modbus addresses.

从下页开始列出了 Modbus 地址列表。

## 4.2 Modbus Addresses

### Modbus 地址

There are 4 types of Modbus addresses:

一共有四类 Modbus 地址：

0x Read/Write digital outputs – off/on commands  
0x 读/写 数字输出信号 – 关闭/开启命令

1x Read digital inputs – off/on signals/indications

1x 读取 数字输入信号 – 关闭/开启信号/指示

These are binary values and have a 0/1 value indicating an off/on or no/yes value.

这些是二进制值，0/1 数值分别代表关闭/开启或者否/是。

3x Read analogue inputs – variable data in  
3x 读取 模拟信号输入 – 可变数据

4x Read/Write analogue outputs – variable adjustments  
4x 读/写 模拟信号输出– 变量调整

These are multiple integer values and have a value of 0 to 65534 and do not contain decimal points i.e. channel 1 position Modbus value is 900 which is equivalent to 90.0°

这些是多重新整数值，数值范围是从 0 到 65534 并不带小数点。例如：频道 1 位置的 Modbus 数值是 900，它等同于 90.0°。

0x			
00001	Enable/Disable M.M. 启用 / 关闭控制模块	0 = Burner is enabled 0 = 启用燃烧器 1 = Burner is disabled 1 = 关闭燃烧器	*This changes the state of the enable/disable button on the M.M. home screen. The changes are kept if Modbus goes “offline.” *这个地址可更改控制模块主页屏幕上的启用/关闭按钮状态。如果 Modbus “下线”，本设置仍有效。

1x			
10217	E.G.A. Optioned 启用 E.G.A.	0 = Trim not optioned 0 = 不启用调节操作 1 = Trim optioned 1 = 启用调节操作	*Returns 0 when option 12 is set for monitoring only. *当选项 12 的数值为 1 – “仅监视”时，本地址数值为 0
10218	Actual up to Trim Threshold 调节阈值	0 = E.G.A. not trimming 0 = E.G.A. 不执行调节 1 = E.G.A. trimming 1 = E.G.A. 执行调节	
10219	E.G.A. Cooler Ready E.G.A. 冷却器就绪	0 = Cooler is ready 0 = 冷却器就绪 1 = Cooler is not ready 1 = 冷却器未就绪	*Returns 0 is the E.G.A. is an error state. *当 E.G.A. 处于错误状态时，本地址数值为 0。
10220	Ambient	0 = Temperature OK	

	Temperature OK 环境温度合格	0 = 温度合格 1 = Temperature not OK 1 = 温度不合格	
10221	NO Optioned 启用 NO 感应器	0 = NO cell not optioned 0 = 不启用 NO 感应器 1 = NO cell optioned 1 = 启用 NO 感应器	
10222	SO <sub>2</sub> Optioned 启用 SO <sub>2</sub> 感应器	0 = SO <sub>2</sub> cell not optioned 0 = 不启用 SO <sub>2</sub> 感应器 1 = SO <sub>2</sub> cell optioned 1 = 启用 SO <sub>2</sub> 感应器	
10224	E.G.A. OK to Sample E.G.A.就绪, 准备取样	0 = E.G.A. is not sampling 0 = E.G.A.不取样 1 = E.G.A. is sampling 1 = E.G.A.取样	
10233	M.M. Hand Mode 控制模块手动模式	0 = Not in hand mode 0 = 非手动模式 1 = In hand mode 1 = 手动模式	
10234	M.M. Low Flame Hold 控制模块低火焰保持	0 = Not in low flame hold 0 = 非低火焰保持 1 = In low flame hold 1 = 低火焰保持	
10242	M.M. Disabled Status 控制模块关闭状态	0 = Burner not disabled 0 = 燃烧器开启 1 = Burner is disabled 1 = 燃烧器关闭	*This shows the state of the enable/disable button on the home screen. Returns same value as address 00001 *这个地址显示主页屏幕上的按钮启用/关闭状态。它的数值与地址 00001 的数值相同。

3x			
30101	Firing Rate 燃烧率	%	
30102	Firing Status 燃烧状态	0 = Non-modulating 0 = 非控制 1 = Modulating 1 = 控制	*0 is for non-modulating states like single point change, fuel flow metering and commissioning * 0 是非控制状态, 比如处于单点更改, 燃料流量计量和调试。
30104	Burner Rating 燃烧器规格	MW x 10	*Always shown as metric. It is calculated from fuel flow metering. *用公制单位。它是计算燃料流量的值。
30105	Actual Value 实际数值	Metric: Temperature °C, Pressure Bar x 10, Low Pressure Bar x 100 Imperial Temperature °F, Pressure PSI, Low Pressure PSI x 10	*Pressure value 015 would be 1.5 Bar if metric, or 15 PSI if imperial *压力数值 015 等同于公制压力 1.5 Bar 或者英制压力 15 PSI

		公制温度 $^{\circ}\text{C}$ , 压力 Bar x 10, 低压 Bar x 100, 英 制温度 $^{\circ}\text{F}$ , 压力 PSI, 低 压 PSI x 10	
30106	Required Value 所需要的值	Metric: Temperature $^{\circ}\text{C}$ , Pressure Bar x 10, Low Pressure Bar x 100 Imperial Temperature $^{\circ}\text{F}$ , Pressure PSI, Low Pressure PSI x 10 公制温度 $^{\circ}\text{C}$ , 压力 Bar x 10, 低压 Bar x 100 英制 温度 $^{\circ}\text{F}$ , 压力 PSI, 低压 PSI x 10	
30107	Selected Fuel (0/1) 所选燃料(0/1)	0 = Fuel 1 0 = 燃料 1 1 = Fuel 2 1 = 燃料 2	
30109	Channel 1 Position 频道 1 位置	Degrees x 10	*457 value would be $45.7^{\circ}$ *457 数值等同于 $45.7^{\circ}$
30110	Channel 2 Position 频道 2 位置	Degrees x 10	
30111	Channel 3 Position 频道 3 位置	Degrees x 10	
30113	M.M. Error Number 控制模块错误代码	Error code 错误代码	*See section 6.1. *参见章节 6.1.
30115	E.G.A. Run O <sub>2</sub> Value E.G.A.运行, 氧气数 值	% x 10	*25 value would be 2.5% *数值 25 等同与 2.5%
30116	E.G.A. Run CO <sub>2</sub> % x 10 Value E.G.A.运行, CO <sub>2</sub> 数 值		
30117	E.G.A. Run CO ppm x 10 Value E.G.A.运行, CO 数 值		
30118	E.G.A. Run Temperature E.G.A.运行, 温度	Metric $^{\circ}\text{C}$ x 10 公制 $^{\circ}\text{C}$ x 10 Imperial $^{\circ}\text{F}$ x 10 英制 $^{\circ}\text{F}$ x 10	
30119	E.G.A. Run Efficiency E.G.A.运行, 效率	% x 10	
30120	E.G.A. Run NO Value E.G.A.运行, NO 数 值	ppm x 10	
30121	E.G.A. Run SO <sub>2</sub> ppm x 10		

	Value
	E.G.A.运行, SO <sub>2</sub> 数值
30122	E.G.A. Commission % x 10 O <sub>2</sub> Value E.G.A. 调试, O <sub>2</sub> 数值
30123	E.G.A. Commission % x 10 CO <sub>2</sub> Value E.G.A. 调试, CO <sub>2</sub> 数值
30124	E.G.A. Commission ppm x 10 CO Value E.G.A. 调试, CO 数值
30125	E.G.A. Commission Metric °C x 10 Temperature 公制 °C x 10 E.G.A. 调试, 温度 Imperial °F x 10 英制 °F x 10
30126	E.G.A. Commission % x 10 Efficiency E.G.A. 调试, 效率
30127	E.G.A. Commission ppm x 10 NO Value E.G.A. 调试, NO 数值
30128	E.G.A. Commission ppm x 10 SO <sub>2</sub> Value E.G.A. 调试, SO <sub>2</sub> 数值

		3x	
30129	E.G.A. Error Code E.G.A. 错误代码	Error code 错误代码	*See Mk8 E.G.A. Set-Up and Trim Guide manual *参见 Mk8 E.G.A. 设置和尾气调节指南
30130	Minimum Remote Setpoint 最小远程设置点	Metric: Temperature °C, Pressure Bar x 10, Low Pressure Bar x 100 Imperial Temperature °F, Pressure PSI, Low Pressure PSI x 10 公制温度 °C, 压力 Bar x 10, 低压 Bar x 100, 英制温度 °F, 压力 PSI, 低压 PSI x 10	
30131	Maximum Remote Setpoint 最大远程设置点	Metric: Temperature °C, Pressure Bar x 10, Low Pressure Bar x 100 Imperial Temperature °F,	

		Pressure	PSI, Low	
		Pressure	PSI x 10	
		公制温度	°C, 压力 Bar x	
		10, 低压	Bar x 100, 英制温度	°F, 压力 PSI, 低压
		PSI x 10		
30132	Current Flow 1000s 电流 1000s	Metric kW Imperial MMBTU/hr x 1000 公制 kW , 英制 MMBTU/hr x 1000	*Remainder after whole number of MW or MMBTU/hr x 1000 taken away. E.g. 1.5MW gives 500 value and 15.1MMBTU/hr gives 100 value * MW 数值或者 MMBTU/hr x 1000 数值被去除整数后的剩余数字。比如: 1.5MW 的对应数值是 500 ; 15.1MMBTU/hr 的对应数值是 100。	
30133	Current Flow Millions 电流 百万	Metric MW Imperial MMBTU/hr 公制 MW , 英制 MMBTU/hr	*Whole number of MW or MMBTU/hr. E.g. 1.5MW gives 1 value and 15.1MMBTU/hr gives 15 value * MW 数值或者 MMBTU/hr x 1000 数值的整数值。比如: 1.5MW 对应数值是 1, 15.1MMBTU/hr 的对应数值是 15	
30134	Fuel 1 Flow Total 1000s 燃料 1 总流量 1000s	Metric kW/hr 公制 kW/hr Imperial MMBTU/hr 英制 MMBTU/hr	*Remainder after whole number of MW/hr or MMBTU x 1000 taken away, x 1000. E.g. 1.5MW/hr gives 500 value and 15.1MMBTU gives 100 value * MW/hr 数值或者 MMBTU x 1000 数值被去除整数后的剩余数字。比如: 1.5MW/hr 的对应数值是 500 ; 15.1MMBTU 的对应数值是 100。	
30135	Fuel 1 Flow Total Millions 燃料 1 总流量 百万	Metric MW/hr 公制 kW/hr Imperial MMBTU 英制 MMBTU/hr	*Whole number of MW/hr or MMBTU. E.g. 1.5MW/hr gives 1 value and 15.1MMBTU gives 15 value * MW/hr 数值或者 MMBTU 数值的整数值。比如: 1.5MW/hr 对应数值是 1, 15.1MMBTU 的对应数值是 15	
30136	Fuel 1 Flow Total Billions 燃料 1 总流量 十亿	Metric GW/hr 公制 GW/hr Imperial MMBTU / 1000 英制 MMBTU / 1000	*Whole number of GW/hr or MMMBTU E.g. 1.5MW/hr gives 0 value and 15.1MMBTU gives 0 value * GW/hr 数值或者 MMMBTU 数值的整数值。比如: 1.5MW/hr 对应数值是 0, 15.1MMBTU 的对应数值是 0	
30137	Fuel 2 Flow Total 1000s 燃料 2 总流量 1000s	Metric kW/hr 公制 kW/hr Imperial MMBTU/hr 英制 MMBTU/hr		
30138	Fuel 2 Flow Total Millions 燃料 2 总流量 百万	Metric MW/hr 公制 MW/hr Imperial MMBTU 英制 MMBTU		
30139	Fuel 2 Flow Total	Metric GW/hr		

	Billions	公制 GW/hr	
	燃料 2 总流量 十亿	Imperial MMBTU / 1000 英制 MMBTU / 1000	
30143	E.G.A. Run Ambient Temperature	Metric $^{\circ}\text{C} \times 10$ 公制 $^{\circ}\text{C} \times 10$	
	E.G.A. 运行, 环境温度	Imperial $^{\circ}\text{F} \times 10$ 英制 $^{\circ}\text{F} \times 10$	
30144	E.G.A. Run Delta Temperature	Metric $^{\circ}\text{C} \times 10$ 公制 $^{\circ}\text{C} \times 10$	
	E.G.A. 运行, Delta 温度	Imperial $^{\circ}\text{F} \times 10$ 英制 $^{\circ}\text{F} \times 10$	
30145	E.G.A. Commission Ambient Temperature	Metric $^{\circ}\text{C} \times 10$ 公制 $^{\circ}\text{C} \times 10$	
	E.G.A. 调试环境温度	Imperial $^{\circ}\text{F} \times 10$ 英制 $^{\circ}\text{F} \times 10$	
30146	E.G.A. Commission Delta Temperature	Metric $^{\circ}\text{C} \times 10$ 公制 $^{\circ}\text{C} \times 10$	
	E.G.A. 调试 Delta 温度	Imperial $^{\circ}\text{F} \times 10$ 英制 $^{\circ}\text{F} \times 10$	
30804	Channel 4 VSD Output	mA x 10 V x 10	*55 value is 5.5mA or 5.5V *数值 55 等同于 5.5mA 或者 5.5V
30805	Channel 4 VSD Input	mA x 10 V x 10	*This input reads correctly even if VSD is not optioned. *即使未启用 VSD, 仍将正确读取输入信号
30830	Lockout 锁定	Error code 错误代码	*See section 6.2 Burner Lockouts *参见章节 6.2 燃烧器锁定

		3x	
30831	Fuel 1 Type 燃料 1 类型	0 = Gas 0 = 燃气 1 = Oil 1 = 燃油	*Option/ parameter 150 value *选项/参数 150 的数值
30832	Fuel 2 Type 燃料 2 类型	0 = Gas 0 = 燃气 1 = Oil 1 = 燃油	*Option/ parameter 151 value *选项/参数 151 的数值
30839	Fuel 1 Hours Run 燃料 1 的运行小时数		*Number of completed hours *完整小时数
30840	Fuel 2 Hours Run 燃料 2 的运行小时数		*Number of completed hours *完整小时数
30843	Fuel 1 Start-Ups 燃料 1 启动		
30844	Fuel 2 Start-Ups 燃料 2 启动		

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30849	Actual Gas Pressure 实际燃气压力	"wg x 10 mbar x 10 PSI x 100	*Output units depend on option/ parameter 131, and is not affected by option 65 metric/ imperial setting. *输出值的单位取决于选项/参数 131 的值，输出值单位不受选项 65 的公 制/英制设置的影响。
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<b>4x</b>			
40001	Required Value 所需数值	Metric: Temperature °C, Pressure Bar x 10, Low Pressure Bar x 100 Imperial Temperature °F, Pressure PSI, Low Pressure PSI x 10 公制温度 °C, 压力 Bar x 10, 低压 Bar x 100。英 制温度 °F, 压力 PSI, 低 压 PSI x 10。	*After 1 minute of no Modbus communications to the unit, the M.M. will ignore this required value and use the required setpoint set on the M.M.'s status screen. *如果控制设备超过 60 秒未收到 Modbus 指令，控制模块将忽略这些 所需数值，转而使用在控制模块屏幕 上已设的设定位数值。
40121	Remote Firing Rate Value 远程燃烧率数值	%	*40131 must be set to 1 to change the firing rate remotely *要远程更改燃烧率，地址 40131 必 须被设为 1
40131	Remote Firing Rate Enable/Disable 远程燃烧率设定， 启用/关闭	0 = Remote firing rate disabled 0 = 远程燃烧率设定关 闭 1 = Remote firing enabled 1 = 远程燃烧率设定开 启	

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## 5 ERRORS AND LOCKOUTS

### 错误和锁定

#### 5.1 M.M. Errors

##### 控制模块错误

Error	Message	Description
错误	错误信息	描述
1	Channel 1 Positioning Error 频道 1 定位错误	Servomotor is outside of the commissioned range 伺服马达运行超出调试范围。 <ul style="list-style-type: none"><li>Check wiring on terminals 40 – 47 检查接线端子 40 – 47 的接线。</li><li>Check signal cable from the M.M. to the servomotor is screened at one end 检查从控制模块到伺服马达的信号电缆是否被一端屏蔽。</li><li>Check potentiometer is zeroed correctly 检查电位计是否被正确调零。</li><li>Go into Commissioning mode, check the servomotor position and ensure that closed is at 0.0° 进入调试模式，检查伺服马达位置，确保其关闭位对应 0.0°</li></ul>
2	Channel 2 Positioning Error 频道 2 定位错误	Servomotor is outside of the commissioned range 伺服马达运行超出调试范围。 <ul style="list-style-type: none"><li>Check wiring on terminals 40 – 47 检查接线端子 40 – 47 的接线。</li><li>Check signal cable from the M.M. to the servomotor is screened at one end 检查从控制模块到伺服马达的信号电缆是否被一端屏蔽。</li><li>Check potentiometer is zeroed correctly 检查电位计是否被正确调零。</li><li>Go into Commissioning mode, check the servomotor position and ensure that closed is at 0.0° 进入调试模式，检查伺服马达位置，确保其关闭位对应 0.0°</li></ul>
3	Channel 3 Positioning Error 频道 3 定位错误	Servomotor is outside of the commissioned range 伺服马达运行超出调试范围。 <ul style="list-style-type: none"><li>Check wiring on terminals 40 – 47 检查接线端子 40 – 47 的接线。</li><li>Check signal cable from the M.M. to the servomotor is screened at one end 检查从控制模块到伺服马达的信号电缆是否被一端屏蔽。</li><li>Check potentiometer is zeroed correctly 检查电位计是否被正确调零。</li><li>Go into Commissioning mode, check the servomotor position and ensure that closed is at 0.0° 进入调试模式，检查伺服马达位置，确保其关闭位对应 0.0°</li></ul>
5	Channel 1 Gain Error 频道 1 增益错误	Servomotor position measurement hardware error 伺服马达位置测量硬件错误 <ul style="list-style-type: none"><li>Check wiring and voltages on terminals 40 – 47 and if no fault found, contact Autoflame</li></ul>

	检查接线端子 40 – 47 的接线和电压。如果未发现故障,请联系 Autoflame。				
6	Channel 2 Gain Error 频道 2 增益错误	Servomotor position measurement hardware error 伺服马达位置测量硬件错误			
	• Check wiring and voltages on terminals 40 – 47 and if no fault found, contact Autoflame 检查接线端子 40 – 47 的接线和电压。如果未发现故障,请联系 Autoflame。				
7	Channel 3 Gain Error 频道 3 增益错误	Servomotor position measurement hardware error 伺服马达位置测量硬件错误			
	• Check wiring and voltages on terminals 40 – 47 and if no fault found, contact Autoflame 检查接线端子 40 – 47 的接线和电压。如果未发现故障,请联系 Autoflame。				
9	Channel 1 Movement Error 频道 1 运动错误	No movement detected when servomotor requested to move 当要求伺服马达运动时,检测到无运动			
	• Check wiring and voltages on terminals 40 – 47 and 70 – 75 检查接线端子 40 – 47 和 70 – 75 的接线和电压。 • Check actual servomotors drive in correct direction 检查伺服马达运动方向是否正确 • Check valve is not stuck 检查阀门是否粘咬				
10	Channel 2 Movement Error 频道 2 运动错误	No movement detected when servomotor requested to move 当要求伺服马达运动时,检测到无运动			
	• Check wiring and voltages on terminals 40 – 47 and 70 – 75 检查接线端子 40 – 47 和 70 – 75 的接线和电压。 • Check actual servomotors drive in correct direction 检查伺服马达运动方向是否正确 • Check damper is not stuck 检查阀门是否粘咬				
11	Channel 3 Movement Error 频道 3 运动错误	No movement detected when servomotor requested to move 当要求伺服马达运动时,检测到无运动			
	• Check wiring and voltages on terminals 40 – 47 and 70 – 75 检查接线端子 40 – 47 和 70 – 75 的接线和电压。 • Check actual servomotors drive in correct direction 检查伺服马达运动方向是否正确 • Check valve is not stuck 检查阀门是否粘咬				
13	Analogue Power Supply Error 模拟供电错误	ADC measured 12V supply out of range ADC 测量电压 12V 供电,超出范围			
	• Check wiring for shorts on terminals 41, 47 and 39 检查接线端子 41, 47 和 39 的接线是否短路 • Remove all plugs apart from power to the unit, go to commissioning mode, and if error continues, contact Autoflame 拔下设备供电插头之外的所有插头,进入调试模式。如果故障仍持续,请联系 Autoflame。				

14	Digital Power Supply Error 数字供电错误	ADC measured 3.3V supply out of range ADC 测量电压 3.3V 供电，超出范围
	<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障，请联系 Autoflame。</li> <li>Remove all plugs apart from power to the unit, go to commissioning mode, and if error continues, contact Autoflame 拔下设备供电插头之外的所有插头，进入调试模式。如果故障仍持续，请联系 Autoflame。</li> </ul>	
Error	Message	Description
错误	错误信息	描述
15	EEPROM Error EEPROM 错误	Fault communicating with the on board EEPROM 与 EEPROM 通讯故障
	<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障，请联系 Autoflame。</li> </ul>	
16	ADC Error ADC 错误	Internal fault 内部故障
	<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障，请联系 Autoflame。</li> </ul>	
17	Watchdog Timeout 监视设备超时	Internal fault 内部故障
	<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障，请联系 Autoflame。</li> </ul>	
18	Processor Clock Error 处理器时钟错误	Internal fault 内部故障
	<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障，请联系 Autoflame。</li> </ul>	
19	System Error 系统错误	Internal fault 内部故障
	<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障，请联系 Autoflame。</li> </ul>	
20	Flash Data Error Flash Data 错误	Internal fault 内部故障
	<ul style="list-style-type: none"> <li>Re-install software SD card and contact Autoflame 重新安装软件 SD 卡并且联系 Autoflame</li> </ul>	
21	Processor Temperature Error 处理器温度错误	Internal fault 内部故障
	<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals and contact Autoflame 检查所有接线端子的接线和电压，并且联系 Autoflame</li> <li>Check ambient temperature of unit does not exceed maximum recommend temperature 检查设备的环境温度是否超过最大建议温度</li> </ul>	
22	Burner Control Comms Error 燃烧器控制通讯错误	Internal fault 内部故障
	<ul style="list-style-type: none"> <li>Contact Autoflame 联系 Autoflame</li> </ul>	

23	Burner Control Reset 燃烧器控制重置	Internal fault 内部故障
• Contact Autoflame 联系 Autoflame		
24	Software Error 软件错误	Internal fault 内部故障
• Contact Autoflame 联系 Autoflame		
25	Zero-Crossing Detection Error 零交点检测错误	Internal fault 内部故障
• Check mains supply going to unit is within acceptable voltage range 检查设备电源输入电压是否在可接受的电压范围之内。		
• Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障, 请联系 Autoflame。		
26	Mains Input Detection Error 干线输入信号检测错误	Mains input stuck on 干线输入中止
• Check wiring and voltages on terminals 89 – 90, and if no fault found, contact Autoflame 检查接线端子 89 – 90 的接线和电压。如果未发现故障, 请联系 Autoflame。		
27	Load Sensor Error 荷载感应器错误	Load sensor is out of range 荷载感应器不在范围内
• Check load sensor wiring and ensure that the return voltage/resistance is less than 1V/ 1kΩ • 检查荷载感应器的接线。确保回复电压/电阻小于 1V/ 1kΩ。		
28	VSD Error 变速驱动错误	Feedback incorrect 回馈信号错误
• Check VSD feedback against commissioned VSD and ensure the feedback is stable 对照调试值检查变速驱动回馈信号, 确保回馈信号稳定。		
29	VSD No Commission Feedback	No feedback detected during commissioning 在调试期间检测不到反馈信号
• Check VSD feedback during commissioning 在调试期间检查变速驱动回馈信号		
• Check wiring on terminals 1 – 3 and 10 – 12 检查接线端子 1 – 3 和 10 – 12 上的接线		
30	Missing Commissioning Data 丢失调试数据	Internal fault 内部故障
• Check there is commissioning data for all options servomotors/VSD 检查所有启用的伺服马达/变速驱动的调试值。		
31	FAR Execution Speed FAR 执行速度	Internal fault 内部故障
• Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障, 请联系 Autoflame。		
32	Software Error 软件错误	Internal fault. 内部故障

				<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障,请联系 Autoflame。</li> </ul>
33	Software Error 软件错误		Internal fault. 内部故障	
				<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障,请联系 Autoflame。</li> </ul>
34	Software Error 软件错误		Internal fault. 内部故障	
				<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障,请联系 Autoflame。</li> </ul>
35	Software Error 软件错误		Internal fault. 内部故障	
				<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子的接线和电压。如果未发现故障,请联系 Autoflame。</li> </ul>
Error	Message	Description		
错误	错误信息	描述		
36	VSD Sampling Error 变速驱动取样错误	VSD feedback current/ voltage too high 变速驱动反馈电流/电压过高		
		<ul style="list-style-type: none"> <li>Check wiring on terminals 1 – 3, and 10 – 12 检查接线端子 1 – 3 和 10 – 12 的接线。</li> </ul>		
37	VSD Feedback Too Low 变速驱动反馈过慢	VSD feedback value is too low during commissioning 在调试过程中变速驱动反馈数值过低		
		<ul style="list-style-type: none"> <li>Check wiring on terminals 1 – 3, and 10 – 12 检查接线端子 1 – 3 和 10 – 12 的接线。</li> <li>Check VSD feedback while commissioning 在调试时检查变速驱动反馈信号</li> </ul>		
38	Air Pressure Commission Fault 空气压力调试故障	Air Pressure Commission Fault Internal fault 内部故障		
		<ul style="list-style-type: none"> <li>Check wiring on terminals 29, 30, 48 and 49 检查接线端子 29, 30, 48 和 49 的接线。</li> <li>Re-commission air pressure sensor. 重新调试空气压力感应器</li> </ul>		
39	Gas Pressure VPS Commission Fault 燃气压力 VPS (阀门校验) 调试故障	Gas pressure during VPS below option/ parameter 133 VPS (阀门校验) 期间的燃气压力低于选项/参数 133 的值		
		<ul style="list-style-type: none"> <li>Check option/ parameter 133 and check gas pressure 检查选项/参数 133 和检查燃气压力</li> <li>Re-commission gas pressure sensor 重新调试燃气压力感应器</li> </ul>		
40	Gas Pressure Run Commission Fault 燃气压力运行调试故障	Gas pressure commissioned value too low for main curve/ golden start 调试后的燃气压力远低于主燃烧曲线/黄金启动		

		的要求
	<ul style="list-style-type: none"><li>• Check option/ parameter 136 检查选项/参数 136</li><li>• Re-commission gas pressure sensor 重新调试燃气压力感应器</li></ul>	Air pressure commissioned value too low for main Air Pressure Commission curve/ golden start Fault 调试后的空气压力远低于主燃烧曲线/黄金启动
41	空气压力调试故障	的要求
	<ul style="list-style-type: none"><li>• Check option/ parameters 147 and 149 检查选项/参数 147 和 149</li><li>• Re-commission air pressure sensor 重新调试空气压力感应器</li></ul>	

## 5.2 Burner Lockouts

### 燃烧器锁定

Lockout 锁定	Message 锁定信息	Description 描述
1	CPI Input Wrong State CPI 输入错误状态	Proof of closure switch opened during ignition sequence 在点火排序时，阀门关闭校验开关开启
	<ul style="list-style-type: none"> <li>Check wiring on terminal 55 检查接线端子 55 的接线</li> <li>Check proof of closure switches 检查阀门关闭校验开关</li> </ul>	
2	No Air Proving 无空气校验	No air pressure during start/ firing 在启动/燃烧时无空气压力
	<ul style="list-style-type: none"> <li>Check wiring on terminal 54 检查接线端子 54 的接线</li> <li>Check air pressure switch 检查空气压力开关</li> <li>Check air pressure sensor 检查空气压力感应器</li> <li>Check air pressures during running 在运行时检查空气压力</li> </ul>	
3	Ignition Output Fault 点火输出故障	Voltage detected when output is off (and vice versa) 当关闭输出信号时，检测到电压（或者当开启输出信号时，检测不到电压）
	<ul style="list-style-type: none"> <li>Check wiring and voltage on terminal 63 检查接线端子 63 上的接线和电压</li> </ul>	
4	Motor Output Fault 马达输出故障	Voltage detected when output is off (and vice versa) 当关闭输出信号时，检测到电压（或者当开启输出信号时，检测不到电压）
	<ul style="list-style-type: none"> <li>Check wiring and voltage on terminal 58 检查接线端子 58 上的接线和电压</li> </ul>	
5	Start Gas Output Fault 点火燃气输出故障	Voltage detected when output is off (and vice versa) 当关闭输出信号时，检测到电压（或者当开启输出信号时，检测不到电压）
	<ul style="list-style-type: none"> <li>Check wiring and voltage on terminal 59 检查接线端子 59 上的接线和电压</li> </ul>	
6	Main Gas 1 Output Fault 主燃气 1 输出故障	Voltage detected when output is off (and vice versa) 当关闭输出信号时，检测到电压（或者当开启输出信号时，检测不到电压）
	<ul style="list-style-type: none"> <li>Check wiring and voltage on terminal 60 检查接线端子 60 上的接线和电压</li> </ul>	
7	Main Gas 2 Output Fault 主燃气 2 输出故障	Voltage detected when output is off (and vice versa) 当关闭输出信号时，检测到电压（或者当开启输出信号时，检测不到电压）

		出信号时，检测不到电压)
• Check wiring and voltage on terminal 61 检查接线端子 61 上的接线和电压	Vent Valve Output Fault 排气阀输出故障	Voltage detected when output is off (and vice versa) 当关闭输出信号时，检测到电压（或者当开启输出信号时，检测不到电压）
• Check wiring and voltage on terminal 62 检查接线端子 62 上的接线和电压	Fail Safe Relay Fault 安全装置继电器故障	Voltage detected when output is off (and vice versa) 当关闭输出信号时，检测到电压（或者当开启输出信号时，检测不到电压）
• Check wiring and voltage on terminal 57 检查接线端子 57 上的接线和电压		
• Check 5A fuse 检查 5A 保险丝		
10	Simulated Flame 模拟火焰	Flame is present when it not should be 火焰在不应存在时存在
• Isolate gas/ oil immediately 立即隔离燃气/燃油		
• Call a certified Commissioning Engineer to investigate 请持证调试工程师来展开调查。		
• If during shutdown a post-purge maybe required for after burn 在关机时有可能需要后吹扫		
11	VPS Air Proving Fail VPS（阀门校验）空气校验	Leak detected during 'air proving' part of VPS 在 VPS（阀门校验）“空气校验”时检测到泄漏
• Check 1 <sup>st</sup> main valve 检查一级主阀门		
• Call a certified Commissioning Engineer to investigate 请持证调试工程师来展开调查。		
12	VPS Gas Proving Fail VPS（阀门校验）燃气校验	Leak detected during 'gas proving' part of VPS 在 VPS（阀门校验）“燃气校验”时检测到泄漏
• Isolate gas 隔离燃气		
• Check 2 <sup>nd</sup> main valve and vent valve 检查二级主阀门和排气阀		
• Check pilot valve if using single valve pilot 如果使用单阀导燃，检查导向阀		
• Call a certified Commissioning Engineer to investigate 请持证调试工程师来展开调查。		
13	No Flame Signal 无火焰信号	No flame detected during ignition/ firing 在点火/燃烧时检测不到火焰
• Visually check flame		

	目测火焰	
• Check the flame scanner 检查火焰监视器		
• Call a certified Commissioning Engineer to investigate 请持证调试工程师来展开调查。		
14	Shutter Fault 快门故障	UV signal detected during shutter operation on self-check 快门自检时检测到紫外线信号
	• Check wiring on terminals 21 and 22 检查接线端子 21 和 22 上的接线	
	• Check UV scanner type and check option/ parameter 110 is set accordingly 检查紫外线监视器型号并且检查选项/参数 110 是否设置正确	
15	NO CPI Reset NO CPI 重置	Proof of closure switch not made after valves closed 阀门关闭后，阀门关闭校验开关未工作
	• Check wiring on terminal 55 检查接线端子 55 上的接线	
	• Check proof of closure switches 检查阀门关闭检验开关	
Lockout	Message	Description
锁定	锁定信息	描述
17	Gas Pressure Low 燃气压力过低	Gas pressure low limit exceeded (gas sensor) 超出燃气压力下限 (燃气感应器)
	• Check gas pressure 检查燃气压力	
	• Check option/ parameter 136 检查选项/参数 136	
18	Gas Pressure High 燃气压力过高	Gas pressure high limit exceeded (gas sensor) 超出燃气压力上限 (燃气感应器)
	• Check gas pressure 检查燃气压力	
	• Check option/ parameter 137 检查选项/参数 137	
19	RAM Test Failed RAM 测试失败	Hardware fault 硬件故障
	• Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子上的接线和电压。如果未发现故障，请联系 Autoflame。	
20	PROM Test Failed PROM 测试失败	Hardware fault 硬件故障
	• Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子上的接线和电压。如果未发现故障，请联系 Autoflame。	
21	FSR Test 1A FSR 测试 1A	Internal relay test failed 内部继电器测试失败
	• Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子上的接线和电压。如果未发现故障，请联系 Autoflame。	

22	FSR Test 2A FSR 测试 2A	Internal relay test failed 内部继电器测试失败
<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子上的接线和电压。如果未发现故障, 请联系 Autoflame。</li> </ul>		
23	FSR Test 1B FSR 测试 1B	Internal relay test failed 内部继电器测试失败
<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子上的接线和电压。如果未发现故障, 请联系 Autoflame。</li> </ul>		
24	FSR Test 3B FSR 测试 3B	Internal relay test failed 内部继电器测试失败
<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子上的接线和电压。如果未发现故障, 请联系 Autoflame。</li> </ul>		
26	Watchdog Fail 2B 监控设备故障 2B	Internal check failed 内部检查失败
<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子上的接线和电压。如果未发现故障, 请联系 Autoflame。</li> </ul>		
28	Watchdog Fail 2D 监控设备故障 2D	Internal check failed 内部检查失败
<ul style="list-style-type: none"> <li>Check wiring and voltages on all terminals, and if no fault found, contact Autoflame 检查所有接线端子上的接线和电压。如果未发现故障, 请联系 Autoflame。</li> </ul>		
29	Input Fault 输入故障	Power supply fault 电源故障
<ul style="list-style-type: none"> <li>Check mains voltage to the M.M. 检查控制模块的干线电压</li> </ul>		
32	Gas Pressure Low Limit 燃气压力下限	Gas pressure too low compared to commissioned value in VPS 燃气压力与 VPS 的调试数值相比过低
<ul style="list-style-type: none"> <li>Check gas pressure sensor value 检查燃气压力感应器数值</li> </ul>		
33	VPS Air Zeroing Fail VPS (阀门校验) 空气归零故障	Fail when venting to atmosphere 排气时发生故障
<ul style="list-style-type: none"> <li>Check vent valve 检查排气阀</li> </ul>		
39	Freeze Timeout Freeze 超时	M.M. kept in Phase Hold for more than 10minutes 控制模块停留在“阶段保持”的时间超过 10 分钟
<ul style="list-style-type: none"> <li>Keep M.M. in Phase Hold during commissioning for less than 10 minutes 在调试时将控制模块的“阶段保持”时长控制在 10 分钟以内。</li> </ul>		
47	Ion. Internal Failsafe Fault 电离/火焰棒, 内部安全装置故障	Internal check failed for flame rod 火焰棒内部检查失败
<ul style="list-style-type: none"> <li>Check wiring on terminal 64 and flame rod 检查接线端子 64 上的接线, 检查火焰棒。</li> </ul>		
48	Ion. Positive Peak Failsafe	Signal check failed for ionisation scanner

	Fault 电离/火焰棒, 正峰值安全 装置故障	电离扫描仪的信号检查故障
• Check wiring on terminal 64 and ionisation scanner 检查接线端子 64 上的接线, 检查电离扫描仪。		
49	Ion. Negative Peak Failsafe Fault 电离/火焰棒, 负峰值安全 装置故障	Signal check failed for ionisation scanner 电离扫描仪的信号检查故障
• Check wiring on terminal 64 and ionisation scanner 检查接线端子 64 上的接线, 检查电离扫描仪。		
50	Ionisation High Ambient 电离/火焰棒, 高环境温度	Flame detected when there shouldn't be. 在不应存在火焰时检测到火焰
• Check wiring on terminal 64 检查接线端子 64 上的接线		
51	Ionisation No Flame 电离/火焰棒, 无火焰	No flame detected when there should be. 在应存在火焰时检测不到火焰
• Check wiring on terminal 64 检查接线端子 64 上的接线		
• Visually check flame 目测火焰		
• Check IR scanner 检查红外线扫描仪		
• Call a certified Commissioning Engineer to investigate 请持证调试工程师来展开调查。		
Lockout 锁定	Message 锁定信息	Description 描述
52	High IR Ambient 高红外线环境温度	Flame detected when there shouldn't be 在不应存在火焰时检测到火焰
• Visually check flame 目测火焰		
• Check IR scanner 检查红外线扫描仪		
• Call a certified Commissioning Engineer to investigate 请持证调试工程师来展开调查。		
53	IR Comms Lost 红外线通讯丢失	Loss of comms with IR scanner 红外线扫描仪的通讯丢失
• Check wiring on terminals 29, 30, 48 and 49 检查接线端子 29, 30, 48 和 49 上的接线		
62	UV Signal Too High 紫外线信号过强	Internal check failed for UV 紫外线的内部检查失败
• Check wiring on terminals 21, 22, 50 and 51 检查接线端子 21, 22, 50 和 51		

	Purge Limit Switch	Interlock not made on terminal 81
63	吹扫限位开关	接线端子 81 上未设置连锁
	<ul style="list-style-type: none"> <li>Check option/ parameter 155 检查选项/参数 155</li> <li>Check wiring on terminal 81 检查接线端子 81 上的接线</li> </ul>	
	Start Limit Switch	Interlock not made on terminal 80
64	启动限位开关	接线端子 80 上未设置连锁
	<ul style="list-style-type: none"> <li>Check option/ parameter 154 检查选项/参数 154</li> <li>Check wiring on terminal 80 检查接线端子 80 上的接线</li> </ul>	
65	FSR A	Internal check failed 内部检查失败
		<ul style="list-style-type: none"> <li>Check wiring and voltages on terminals, and if no fault found, contact Autoflame 检查接线端子上的接线和电压。如果未发现故障, 请联系 Autoflame。</li> </ul>
66	FSR B	Internal check failed 内部检查失败
		<ul style="list-style-type: none"> <li>Check wiring and voltages on terminals, and if no fault found, contact Autoflame 检查接线端子上的接线和电压。如果未发现故障, 请联系 Autoflame。</li> </ul>
67	Gas Pressure Sensor	Signal lost from gas pressure sensor 燃气压力感应器失去信号
	Timeout	燃气压力感应器超时
		<ul style="list-style-type: none"> <li>Check gas pressure sensor wiring on terminals 29, 30, 48 and 49 检查接线端子 29, 30, 48 和 49 上燃气压力感应器的接线。</li> </ul>
68	Wrong Gas Pressure Sensor Type	Wrong gas pressure sensor detected 检测到错误的燃气压力感应器
		错误的燃气压力感应器 类型
		<ul style="list-style-type: none"> <li>Check options/ parameter 128 and 156 检查选项/参数 128 和 156</li> </ul>
69	Gas Pressure Sensor Fault	Internal pressure sensor fault 内部压力感应器故障
	Timeout	燃气压力感应器故障
		<ul style="list-style-type: none"> <li>Contact Autoflame 请联系 Autoflame</li> </ul>
70	UV SP1 Comms Failure	Internal UV scanner fault 内部紫外线监视器故障
	Timeout	紫外线 SP1 通讯失败
		<ul style="list-style-type: none"> <li>Contact Autoflame 请联系 Autoflame</li> </ul>
71	Air Pressure Sensor	Signal lost from air pressure sensor 空气压力感应器的信号丢失
	Timeout	空气压力感应器超时
		<ul style="list-style-type: none"> <li>Check air pressure sensor wiring on terminals 29, 30, 48 and 49 检查接线端子 29, 30, 48 和 49 上的空气压力感应器接线</li> </ul>

72	Air Pressure Wrong Sensor Type 错误的空气压力感应器 类型	Wrong air pressure sensor detected 检测到不正确的空气压力感应器
• Check option/ parameter 148 检查选项/参数 148		
73	Air Pressure Bad Value 空气压力坏值	Internal pressure sensor fault 内部压力感应器故障
• Contact Autoflame 请联系 Autoflame		
74	Air Pressure Commissioned Wrong Zero Value	Air pressure value is more than 5mbar from sensor's 零值 空气压力数值和感应器零值相差 5mbar 以上 空气压力零调试值错误
• Check air pressure sensor value during VPS 在 VPS (阀门校验) 期间检查空气压力感应器数值		
75	Air Pressure Commissioned Wrong High Value	Incorrect air pressure value 不正确的空气压力数值 空气压力，高调试值错误
• Check air pressure sensor value during VPS 在 VPS (阀门校验) 期间检查空气压力感应器数值 • Check wiring on terminals 29, 30, 48 and 49 检查接线端子 29, 30, 48 和 49 上的接线		
76	Air Pressure Window Out of Incorrect air pressure value 范围	Incorrect air pressure value 错误的空气压力值 空气压力超出范围值
• Check air pressure sensor value during VPS 在 VPS 期间检查空气压力感应器数值		
77	Wait For Air Switch Timeout “等待空气开关”超时	Voltage has not been reset for 2minutes 电压超过两分钟未被重置
• Check air pressure sensor value during VPS 在 VPS 期间检查空气压力感应器数值。 • Check voltage has been resets on terminal 54 within 2minutes 在接线端子 54 上检查电压是否在两分钟内被重置。 • Check wiring and voltage on terminal 54 检查接线端子 54 上的接线和电压。		
Lockout	Message	Description
锁定	锁定信息	描述
78	VPS Gas Input Too High VPS 燃气输入值过高	Gas pressure too high during VPS 在 VPS 期间燃气压力过高
• Isolate gas 隔离燃气		

- Check 1<sup>st</sup> main valve and vent valve  
检查一级主阀门和排气阀
- Check option/ parameter 134  
检查选项/参数 134
- Call a certified Commissioning Engineer to investigate  
请持证调试工程师来展开调查。

199      UV Error                    Internal check failed  
紫外线错误                    内部检查失败

- Check wiring and voltages and contact Autoflame  
检查接线和电压。联系 Autoflame。

201      CPU PU Fail                Internal check failed  
CPU PU 故障                    内部检查故障

- Check wiring and voltages and contact Autoflame  
检查接线和电压。联系 Autoflame。

202      EEPROM Fail               Internal check failed  
EEPROM 故障                    内部检查故障

- Check wiring and voltages and contact Autoflame  
检查接线和电压。联系 Autoflame。

### 5.3 Troubleshooting and Further Information

故障检修和进一步信息

#### 5.3.1 UV Shutter Faults

紫外线快门故障

UV shutter fault— there are two LED's on the back of the self-check UV. The red LED indicates the presence of a flame; the yellow LED indicates shutter operation. The red LED will flicker in the presence of UV light. Every 60 seconds the yellow LED will come on, indicating that the shutter is closing. The red LED should then extinguish briefly. If this is not happening check the wiring to self-check UV sensor:

紫外线快门故障 – 自检紫外线感应器的后侧装有两个LED灯。红色LED灯指示火焰存在；黄色LED灯指示快门运行。当火焰存在时红色LED灯将闪烁。每隔60秒黄色LED灯将点亮并指示快门将关闭，随后红色LED灯会短暂熄灭。如果这两个LED灯的运行与上述描述不符，操作者应检查自检紫外线感应器的接线。

Green wire = Terminal 22

绿线 = 终端22

Yellow wire = Terminal 21

黄线 = 终端21

Blue wire = Terminal 50

蓝线 = 终端50

Red wire = Terminal 51

红线 = 终端51

#### 5.3.2 UV Problems

紫外线问题

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If the red LED's fail to illuminate but the burner operates, it is likely that the 2 wires are crossed. This must be corrected. Once corrected a full flame signal strength will be displayed/registered.

如果在燃烧器运行时红色LED灯未亮起，原因可能是2个线路发生交错。操作者应立即更正这个问题。问题解决后系统将显示/登记一个完全火焰信号强度。

The Autoflame UV software utilises early spark termination within the internal flame safeguard control. Therefore, detection of the ignition spark is allowed. During start-up the ignition is de-energised and the pilot flame must be proven without the spark before the main fuel valves are open (safety shut off). Due to the above statement it is not necessary to have a sight tube on the UV for pick-up. This, in fact, will drastically reduce the flame pick-up.

Autoflame紫外线软件在火焰安全措施方面使用了早期火花终止控制，所以Autoflame并不阻止紫外线探测器探测点火火花。在锅炉启动时点火程序已被关闭，而且在主燃料阀门开启前导燃火焰校验必需在无点火火花时进行（阀门安全关闭）。因为这些原因，燃烧器内部不用再安装一根观察管来拾取紫外线信号。安装在燃烧器内部的观察管会大幅降低能获得的紫外线数量。

If insufficient UV is detected, it is advised to use a swivel mount assembly (UVM60003/UVM60004) in order to obtain maximum pick-up. This will allow the commissioning engineer to reliably sight the UV for optimum performance and trouble free operation.

如果不能探测到充足紫外线，我们建议使用旋转支座装置(UVM60003/UVM60004)来最大程度获得紫外线信号，这便于调试工程师全面观察紫外线情况和确保燃烧的最佳性能和顺利运行。

**Note: Under no circumstances is a non-Autoflame UV scanner permitted to be used. This is in breach of all codes and approvals associated with the Autoflame combustion management system. This may lead to serious equipment damage, critical injury or death.**

注意：禁止使用非Autoflame的紫外线监视器。使用非Autoflame紫外线监视器不符合与Autoflame燃烧管理系统相关的所有规范和标准。使用非Autoflame紫外线监视器可能会导致严重的设备损坏和重大的人身伤害和伤亡。

If a non-Autoflame scanner is required then please contact Autoflame directly for technical support. For more information on UV scanners, please refer to M.M. Flame Safeguard and Operation.

如果用户需要使用非Autoflame紫外线监视器，请直接寻求Autoflame的技术支持。请阅读控制模块火焰安全运行手册。

### 5.3.3 Snubbers

#### 缓冲器

The Autoflame system has internal components which protects itself against voltage/current spikes and electrical interference. In some installations this internal protection is not enough,

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especially when the main fuel valve Terminals 60 and 61 have been connected to older gas valves and voltage/current spikes have occurred when the valves have been switched on or off. This can cause internal damage to the M.M. Snubbers can be used on these old gas valves to protect the M.M. from these spikes; they should be fitted across the power terminals of the gas valves. Please contact Autoflame Sales for more information.

在Autoflame系统内部有对抗突增瞬间电压/电流和电气干扰的部件。但在某些情况下这个内在部件并不足以起到保护，特别是当主燃料阀门端口60和61与较老的燃气阀门相连接时这些阀门的开启/关闭将产生突增的瞬间电压/电流，这会导致控制模块损坏。将缓冲器安装到这些较老的燃气阀门上可以起到保护控制模块的作用。缓冲器应被跨接安装在这些燃气阀门的电源终端上。请联系Autoflame获得更多信息。

#### 5.3.4 Channel Positioning Error

##### 频道定位错误

The ‘Channel Positioning’ M.M. Error is caused by incorrect wiring and incorrect servomotor position. In addition to checking the wiring, and zeroing the potentiometer, please also check that the correct voltage is supplied to the servomotors, which should be  $\pm 10\%$  of the required voltage, and the unit is earthed properly. This can cause hunting issues if not at the required voltage or incorrect earthing.

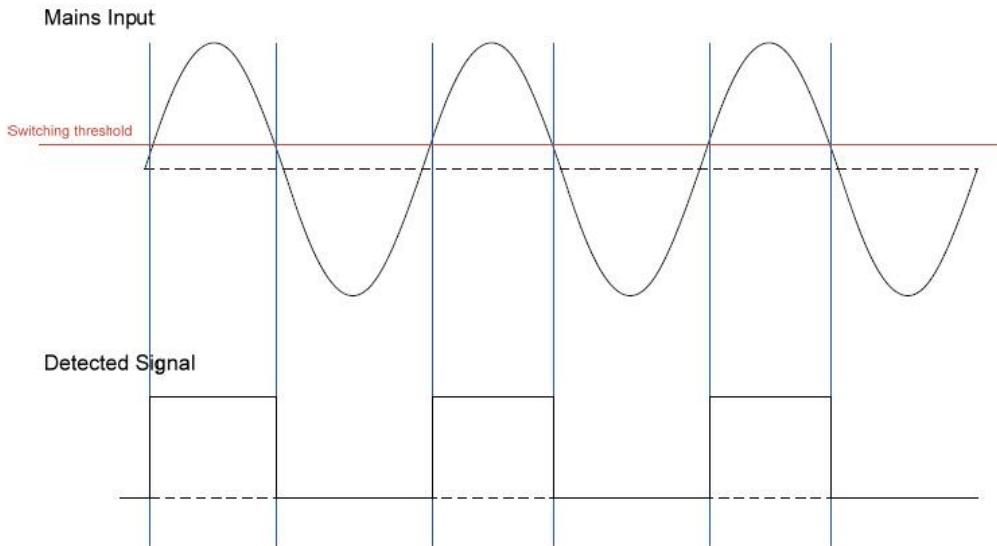
接线不当和错误的伺服马达位置会造成控制模块“频道定位”错误。除了要检查接线和电位计调零是否正确之外，操作者还要检查伺服马达的供电电压（正确的供电电压是所需电压 $\pm 10\%$ ）和接地是否正确。错误的供电电压或者接地都会造成频道定位错误。

#### 5.3.5 Input Fault

##### 输入故障

The ‘Input Fault’ M.M. Error relates to a fault with the power supply going to the M.M. The M.M. verifies the power supply going to the unit; the mains inputs are sampled to check the DC voltage. The diagram below illustrates the AC voltage that comes in through the power supply with the detected signal (digital input).

控制模块的输入故障和控制模块的电源故障有关。控制模块验证电源的方法是取得干线电压的样本来检查直流电压值。下图为电源交流电压输入的已检测信号（数字输入）。



The M.M. checks the ON state of the digital signal in the mains input; the ON state of the digital input should be 50%. This means that the digital input should be in the ON state for a half-wave of the AC signal. The OFF state is safe. If the M.M. sees the digital input being ON for more than 75% across a sample period, then it will get stuck in an unsafe state. This will cause an Input Fault lockout to occur.

控制模块将检查电源干线数字输入信号的导通状态；导通的数字输入信号应该占整体数字输入信号的50%，也就是说数字输入信号在交流电压的半波幅范围内应该处于导通状态。断开的电源干线数字输入信号是安全的。所以如果样本分析的结果显示有超过75%的数字输入信号处于导通状态，那么控制模块就处于不安全状态。这会导致输入故障锁定。

If this lockout persists, the mains input should be checked. To troubleshoot this issue, please check for any DC voltage in the mains voltage and contact your local power supplier.

如果持续出现该锁定，需检查干线电压输入。操作者要检查干线电压中的直流电压并且联系当地供电公司。

### 5.3.6 Setting Conflicts

#### 设置冲突

Some of the option/parameter values may require another option/parameter to be set.

Please see the below table for these option/parameter settings conflicts.

系统中的一些选项/参数设置值需要另一些选项/参数设置值的配合。下表列出了所有选项/参数设置值的相互冲突。

Option 选项	Parameter 参数	Message 信息	Description 描述
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118,135		(118) (135) NFPA Post Purge must be at least 15 seconds. (118) (135)NFPA后吹扫的时间必需大于15秒。	If NFPA Post Purge is Optioned (Option 135), Post Purge Time (Option 118) must be at least 15 seconds. 如果启用NFPA后吹扫（选项135），后吹扫时间（选项118）必需大于15秒。
116,150		(116) Fuel 1 2nd Safety time too high for Gas. 选项(116)在燃料1是燃气时的第二安全时间过长。	If Fuel 1 is Gas (Option 150) the maximum allowed Second Safety Time (Option 116) is 10 seconds. 如果燃料1是燃气（选项150），允许的最长第二安全时间（选项116）是10秒。
123,151		(123) Fuel 2 2nd Safety time too high for Gas. 选项(123)在燃料2是燃气时的第二安全时间过长。	If Fuel 2 is Gas (Option 151) the maximum allowed Second Safety Time (Option 123) is 10 seconds. 如果燃料2是燃气（选项151），允许的最长第二安全时间（选项123）是10秒。
128,156		(128) (156) T82 is not set as VPS input. (128) (156) T82未被设置成VPS输入。	If Gas Pressure Limits/Valve Proving is Optioned and Configured as Digital Input (Option 128), T82 must be configured as the input for Valve Proving (Gas pressure switch). 如果启用了燃气压力极限/阀门校验并且启用了数字输入（选项 128），终端82必需被设为阀门校验干线输入（燃气压力开关）
30,31		(30) (31) Invalid remote setpoint configuration. (30) (31)无效远程设定点配置	Minimum DTI/Modbus setpoint cannot be greater than Maximum DTI/ Modbus setpoint. 最低DTI/Modbus设定点不能大于最高DTI/Modbus设定点。
125,150		(125) (150) Gas pressure sensor cannot be optioned when fuel type is oil (Fuel 1). (125) (150)当燃料是燃油	Cannot configure Gas Pressure Limits/Valve Proving on Fuel 1 if Fuel 1 is configured as oil.

		(燃料1) , 不能启用燃气压力感应器。	当燃料1被设置为燃油时，不能为燃料1配置燃气压力极限/阀门校验。
126,151		(126) (151) Gas pressure sensor cannot be optioned when fuel type is oil (Fuel 2). (126) (151) 当燃料是燃油 (燃料2) , 不能启用燃气压力感应器。	Cannot configure Gas Pressure Limits/Valve Proving on Fuel 2 if Fuel 2 is configured as oil. 当燃料2被设置为燃油时，不能为燃料2配置燃气压力极限/阀门校验。
16	89	(P89) (16) Stat Exerciser cannot be used with sequencing. (P89) (16) 控制点不能与排序程序一起使用	Stat Exerciser should not be optioned if sequencing is enabled. 如果启用排序，控制点就不应被使用。
16	85	(P85) (16) Modulation Exerciser cannot be used with sequencing. 控制点不能与排序一起使用。	Modulation Exerciser should not be optioned if sequencing is enabled. 如果启用排序，控制点就不应被使用。
16,45		(45) (16) External Modulation cannot be used with sequencing. (45) (16) 外部控制不能和排序一起使用	(45) (16) External Modulation cannot be used with sequencing. (45) (16) 外部控制不能和排序一起使用
81,82, 83,84		(81,82,83,84) OTC Configuration Invalid. (81,82,83,84) 室外温度控制的配置失效	Option 81 and 83 cannot be equal (Setpoints at high/low temperature). Option 82 and 84 cannot be equal (Minimum and maximum outside temperature). 选项81和83不能相等(在最高/最低温度时的设定点)。 选项82和84不能相等(最低和最高室外温度)。
1,81,83		(1) (81,83) OTC setpoints too high for optioned load sensor. (1) (81,83) 对于启用的荷载感应器，室外温度控制设定点过高。	The highest setpoint that can be generated by the OTC settings is beyond the measurement range of the currently optioned load sensor. 室外温度控制的最高设定点超出了当前荷载感应器的测量范围。

125,126, 129,135		(125,126) (129) (135) Post VPS cannot be optioned with NFPA Post Purge. (125,126) (129) (135)后VPS (阀门校验) 不能和NFPA后吹扫一同启用。	VPS can only run before burner start up when using NFPA Post Purge. 当使用NFPA后吹扫时，VPS 只能在燃烧器启动之前运行。
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### 5.3.7 Forced Commission

#### 强迫性调试

The M.M. will be forced into Commission mode if there is an option/parameter conflict as in 5.3.6, in addition to the following reasons listed below:

在5.3.6中所列的设置冲突情况下和在下表所列的情况下控制模块都将进入强迫性调试。

Message Displayed 显示信息	To Check 检查项	Explanation 解释
Fuel not commissioned. 燃料未调试		The fuel has not been commissioned. 燃料还未被调试。
Servo configuration does not match commissioning. 伺服马达配置不符合调试数值	Option 8 选项8	The optioned number of servos is different than that stored in the commission data. 启用的伺服马达数量与调试数值不符。
VSD configuration does not match commissioning. 变速驱动配置不符合调试数值	Option 90, Option 91, Option 95 选项90, 选项91, 选项95	VSD configuration has changed since commissioning. May be change if if the VSD is optioned or the input/output type (e.g. voltage vs current) 完成调试后变速驱动设置发生改变。有可能是由于输入/输出类型发生变化（例如：电压 vs 电流）
Golden Start optioned but not commissioned. 启用黄金启动，但还未经调试	Option 29 选项29	Golden start has been optioned on but not commissioned. 启用黄金启动，但还未经调试。
FGR optioned but not commissioned. 启动烟气再循环，但还未经调试	Option 48, Option 49, Option 50 选项48, 选项49, 选项50	FGR has been optioned on but not commissioned. 启动烟气再循环，但未经过调试。
EGA fuel/air-rich trim ranges changed. EGA富油/富气EGA调节范围改变	Parameter 13, Parameter 19 参数13, 参数19	EGA trim quantity at commission has been changed since fuel was commissioned. 完成燃料调试后EGA调节设定值改变。
BC Option/Parameter	Option 110 -	Burner control options (Option 110 and higher)

mismatch. 燃烧器控制选项/参数不符	Option 160 选项110 – 选项160	must match in both Option and Parameter settings. 燃烧器控制选项（选项110– 选项160）的选项/参数值必需一致。
Invalid Option value. 无效选项值		An Option value is outside the allowed range. This may happen if the allowed range changes on upgrade. View Options and fix any invalid values. 选项值超出允许范围。这种情况可能是因为系统升级造成数值范围发生了改变。检查各选项，修改所有无效值。
Invalid Parameter value. 无效参数值		A Parameter value is outside the allowed range. This may happen if the allowed range changes on upgrade. View Parameters and fix any invalid values. 参数值超出允许范围。这种情况可能是因为系统升级造成数值范围发生了改变。检查各参数，修改所有无效值。
Options have been reset. 选项被重置		Options could not be loaded from non-volatile storage and were reset to default values. 无法从存储器下载选项值。选项被重置到默认值。
Parameters have been reset. 参数被重置		Parameters could not be loaded from non-volatile storage and were reset to default values. 无法从存储器下载参数值。参数被重置到默认值。
VPS sensor not commissioned. VPS（阀门校验）感应器未被调试		Gas pressure sensor has been optioned on but not commissioned. Perform a Gas Pressure commission or full commission. 启用未经调试的燃气压力感应器。执行燃气压力调试或者全调试。
Commissioned gas pressure during valve proving too low. 在阀门校验期间燃气压力调试值过低。	Option 133 选项133	The gas pressure commissioned during valve proving is smaller than Option 133, meaning that zero pressure would be enough to pass the pressure test 在阀门校验时燃气压力调试值小于选项133的数值，这意味着0压力也能够通过压力测试。
Commissioned running gas pressure too low. 调试的运行燃气压力过低	Option 136 选项136	The commissioned gas pressure for one or more points falls below Option 136, and so a drop in pressure would not fail the running gas pressure test. 一个或多个设定位的燃气压力调试值低于选

		项136的数值，这意味着压力下降也能够通过运行燃气的压力测试。
APS sensor not commissioned. 空气压力感应器未调试		Air pressure sensor has been optioned on but not commissioned. Perform an Air Pressure commission or full commission. 启用未经调试的空气压力感应器。执行空气压力调试或者全调试。
Commissioned air pressure too low. 调试的空气压力过低	Option 147, Option 149 选项147, 选项149	Air pressure at at least one commissioned point is below the error detection threshold in Option 147 or Option 149. 至少一个设定位上的调试空气压力低于选项147或者选项149的检错阈值。
IR Upload was completed successfully, check configuration then restart. 成功完成红外线上传，检查配置并且重启		This message appears once after every successful upload. 在每次红外线上传成功后显示本信息。
Options and/or Parameters reset to default values. Check configuration then restart. 选项和/或参数被重置到默认值。检查配置并重启。		The Options or Parameters were reset using Option 160. 用选项160把选项/参数重置到默认值。

## 6 STANDARDS

### 标准

The Mini Mk8 M.M. has been tested and approved to the following standards:

Mk8微型控制模块已通过测试并且符合下列标准。

C22.2 No. 199-M89

UL 372, 5<sup>th</sup> Edition

BS EN 298:2012

BS EN 12067-2:2004

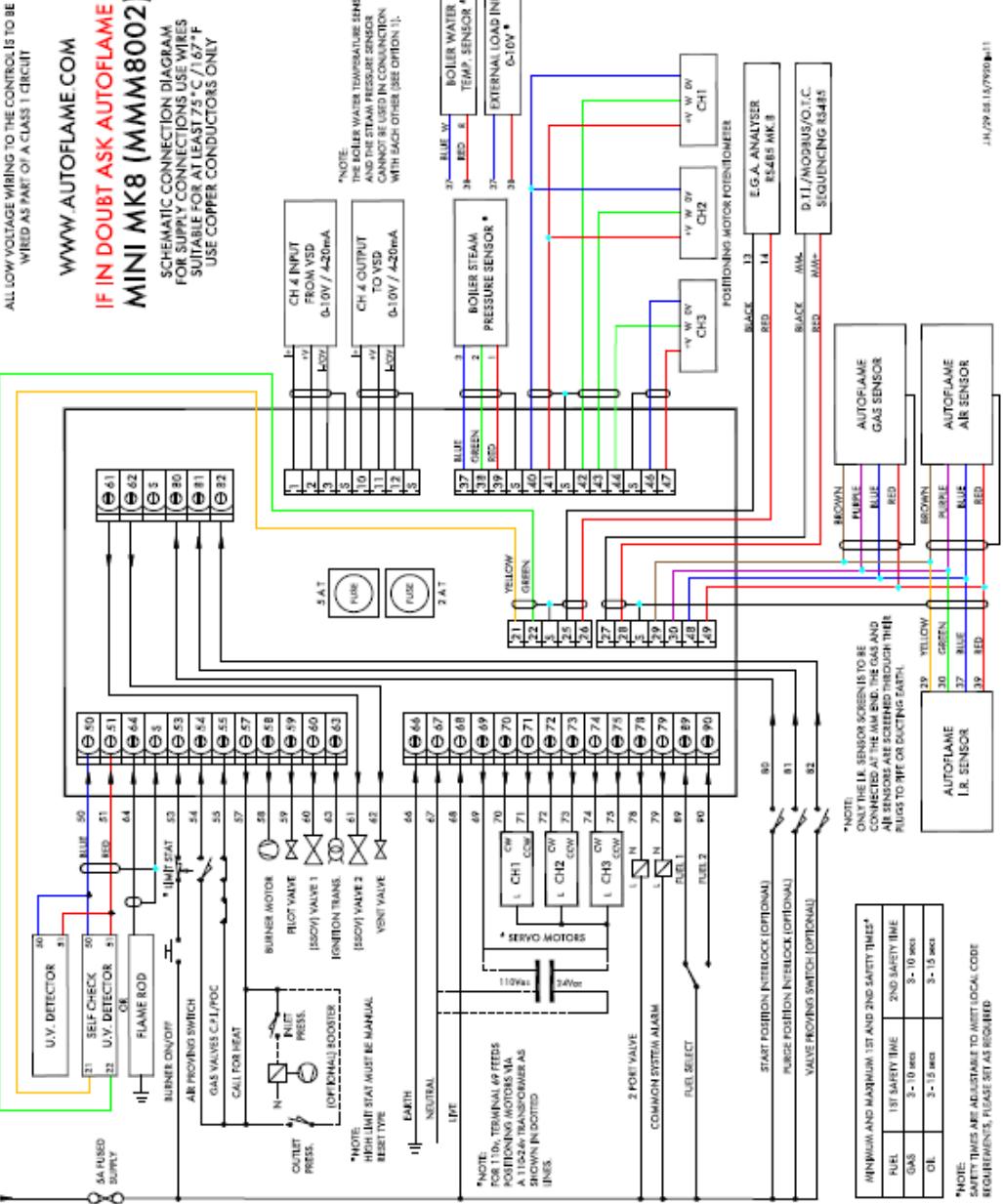
BS EN 1643:2014

ISO 23552-1:2007

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## Notes 笔记





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