



燃烧管理系统



AUTOFLAME FLAME SCANNERS GUIDE 火焰检测器指南

2022.03.31



燃 烧 管 理 控 制 系 统

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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 MM/EGA systems. This is for safety reasons and effective use of the MM/EGA 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 保修条款

- Two years on all electronic and electro-mechanical equipment, assemblies and components.
对所有电子系统和部件实行两年售后保修；
- One year on all EGA systems and UV & IR scanners, including parts, components, cells and sensors.
对所有机械系统和部件和传感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.

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'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.

Autoflame 产品保修条款只适用于产品制造质量问题 and 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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IMPORTANT SAFETY NOTES

重要安全注意事项



An Autoflame flame scanner must be used with the Mk8 MM and Mini Mk8 MM systems. A third party flame sensor must never be used with the MM systems. If a third party flame detector is used then all the CE and UL approvals are void. This can also be very dangerous and can result in serious or even fatal injury, and may cause permanent equipment failure and substantial property damage.

Mk8 控制模块和 Mk8 微型控制模块系统必须使用 Autoflame 火焰检测器。不得在控制模块系统中使用第三方火焰检测器。如果使用第三方火焰检测器，那么所有的 CE 和 UL 认证都无效。这也可能非常危险，会导致严重甚至致命的伤害，并可能导致永久性的设备故障和重大的财产损失。

Flame scanners must be installed, wired, commissioned and adjusted by an Autoflame trained and certified technician.

火焰检测器必须由 Autoflame 培训和认证的技术人员安装，接线，调试和调节。

Any person installing, wiring, commissioning or adjusting the flame scanners without undergoing proper Autoflame training and without full understanding of the Micro Modulation (MM) system may put themselves and others in a seriously dangerous situation that can result in serious injury or even death, and may cause permanent equipment failure and substantial property damage.

任何人安装、布线、调试或调整火焰检测器而没有接受适当的 Autoflame 培训和没有全面了解微调制(控制模块)系统可能使自己和他人处于严重危险的情况下,可能导致严重伤害甚至死亡,而且可能造成永久性设备故障和大量的财产损失。

Some of the wiring connections are live, make sure to totally and safely isolate the mains power before undergoing any work related to the flame scanners. Failure to do so can result in fatal injury.

一些线路连接是带交流电的，请确保在进行任何与火焰检测器相关的工作之前，完全安全地隔离电源。如果不这样做，可能会导致致命的伤害。

This guide must be read in conjunction with the relevant MM system manual.

本指南必须与相关的控制模块系统手册一起阅读。

1. **UV Flame Scanners**

紫外线火焰检测器

Ultraviolet (UV) flame scanners work by detecting the UV radiation emitted from the flame. UV scanners have very quick response and can detect flame in as little as 3 to 4 milliseconds.

紫外线(UV)火焰检测器的工作原理是检测火焰发出的紫外线辐射。紫外检测器有非常快的响应，可以在 3 到 4 毫秒内检测火焰。

UV scanners can be used for most gaseous fuels including Natural Gas, LPG, Methane, Biogas, Hydrogen and many others. They can also be used on most liquid fuels including Diesel, Kerosene, Heavy Fuel Oil, Light Fuel Oil, Biodiesel, Methanol and many others. However on some fuels IR scanners are recommended as they can achieve better flame detection results.

紫外线检测器可用于大多数气体燃料，包括天然气，液化石油气，甲烷，沼气，氢气和许多其他。它们也可用于大多数液体燃料，包括柴油、煤油、重油、轻燃料油、生物柴油、甲醇和许多其他燃料。然而，在一些燃料上推荐红外检测器，因为他们可以达到更好的火焰检测结果。

The following UV scanners are available:

可使用以下紫外线检测器：

Part # 产品号#	Sensitivity Level 敏感度水平	View 视角	Self-Check function 自检功能
MM60003/HS	High 高	End View 端视角	Yes
MM60003/HS/SV	High 高	Side View 侧视角	Yes
MM80004	Standard 标准	Side View 侧视角	No
MM60004	Standard 标准	Side View 侧视角	No
MM60004/U	Standard 标准	End View 端视角	No
MM60004/HSU	High 高	End View 端视角	No

ATEX approved UV scanners are also available for use in Hazardous Environment where Explosion Proof, ATEX approved Equipment required:

ATEX 认证的紫外线检测器也可用于需要防爆设备的危险环境：

Part # 产品号#	Sensitivity Level 敏感度水平	View 视角	Self-Check function 自检功能
MM60003/HS/EXP	High 高	End View 端视角	Yes
MM60004/U/EXP	Standard 标准	End View 端视角	-

Note: Excessive vibration and heat can considerably reduce the lifespan of the flame scanner

注：过高的振动和热量会大大减少火焰检测器的寿命

Standard Approvals: BS EN 298 2012

标准认证：BS EN 298 2012

1.1. MM60003/HS - Self-Check, High Sensitivity, End View UV Scanner MM60003/HS - 自检，高灵敏度，端视紫外线检测器



Specifications 规格

Part Number 产品号	MM60003/HS
Flame Detection Technology 火焰检测技术	UV 紫外线
Lens Angle 镜片角度	0.00° - End view 端视图
Sensitivity Level 敏感度水平	High 高
Self-Check 自检	Mechanical Shutter 机械快门挡板
Max. Flame Detection Distance 最大火焰检测距离	1,500mm (60") 1500 毫米 (60 英寸)
Max. Operating Temperature 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating IP 级别	54
NEMA Rating NEMA 级别	3
Housing Material 外壳材料	Aluminium 铝
Lead Included 包括主线	-
Cable Gland 电缆格兰头	PG11 to ½" conduit adaptor PG11 到半英寸管道适配器
Power Consumption 功率消耗	0.5W – Powered by MM 0.5W – 控制模块驱动
Mounting	Any orientation. Lens must be in direct view of flame

底座	任何方向，UV 镜片必须直接对准火焰
Compatible With 兼容设备	Mk8 MM, Mini Mk8 MM, Mk7 MM, Mk6 MM.
Dimensions (Length x Diameter) 尺寸 (长*直径)	140 x 70 mm (5.51" x 2.76") 140 x 70 毫米 (5.51 英寸 x 2.76 英寸)
Mounting 底座	1" BSPT socket 1"连插座
Max. Cable Length 最大电缆长度	25m (82ft) 25 米 (82 英尺)
Warranty 保修	1 year limited warranty 1 年有限质保
Max. allowed vibration level 允许最大的震动水平	1.8 ms ⁻²
Approval Standards 认证的标准	EN 13611: 2007 7.10.2.2 EN 60068-2-6:2008

Wiring 接线

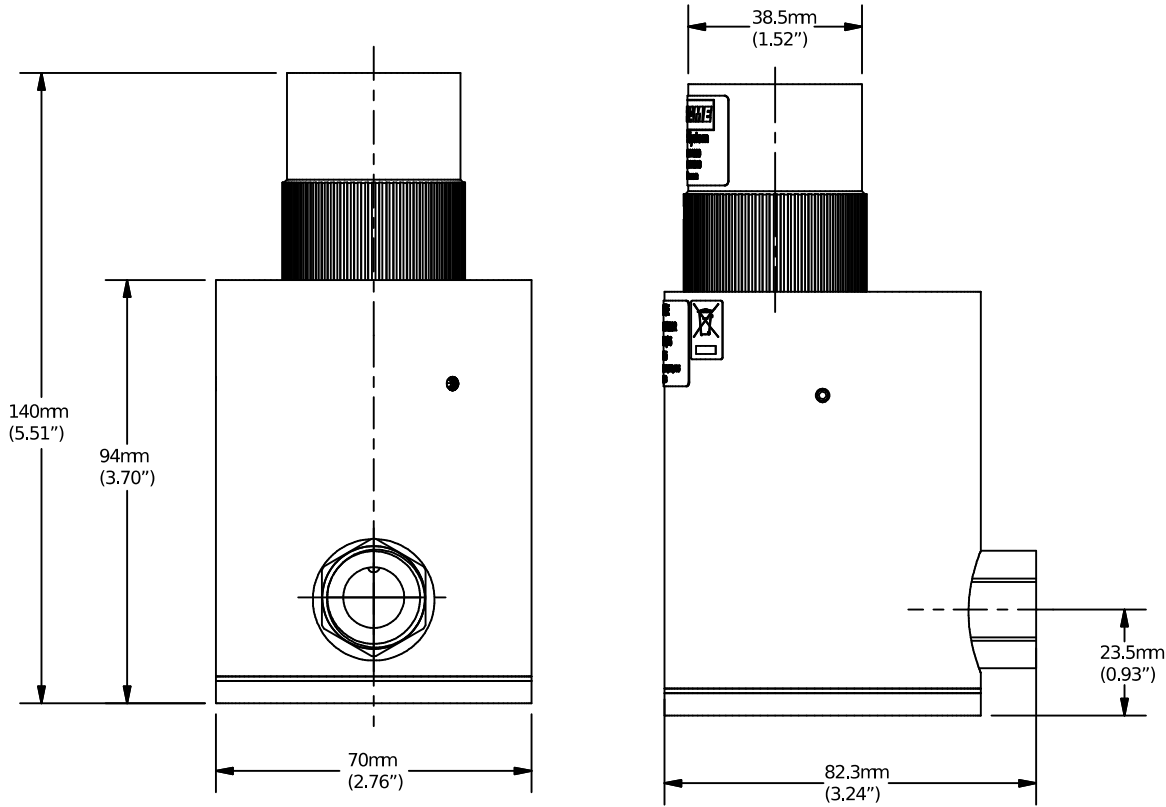
Scanner Terminal 检测器端口		Wire Colour 接线颜色	MM Terminal 控制模块端口
50	0V	Red 红	50
51	300VDC pulse 300 伏直流脉冲	Blue 蓝	51
21	Shutter drive 挡光板驱动	Yellow 黄	21
22	Shutter drive 挡光板驱动	Green 绿	22
-	-	Screen 屏幕线	S

LED Colour LED 颜色	Flashing Checks 闪烁检查
Red 红	UV Detection 紫外线检测
Yellow 黄	Shutter Operation 挡光板操作



Dimensions

尺寸



1.2. MM60003/HS/SV - Self-Check, High Sensitivity, Side View UV Scanner

MM60003/HS/SV - 自检，高灵敏度，侧视紫外线检测器



Specifications 规格

Part Number 产品号	MM60003/HS/SV
Flame Detection Technology 火焰检测技术	UV 紫外线
Lens Angle 镜片角度	90.00° - Side view 侧视图
Sensitivity Level 敏感度水平	High 高
Self-Check 自检	Mechanical Shutter 机械挡板
Max. Flame Detection Distance 最大火焰检测距离	1,500mm (60") 1500 毫米 (60 英寸)
Max. Operating Temperature* 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating IP 等级	54
NEMA Rating NEMA 等级	3
Housing Material 外壳材料	Aluminium 铝
Lead Included 包括主线	-
Cable Gland 电缆格兰头	PG11 to ½" conduit adaptor PG11 到半英寸管道适配器
Power Consumption 功率消耗	0.5W – Powered by MM 0.5W – 控制模块驱动

Mounting 支架	Any orientation. Lens must be in direct view of flame 任何方向，UV 镜片必须直接对准火焰
Compatible With 兼容设备	Mk8 MM, Mini Mk8 MM, Mk7 MM, Mk6 MM.
Dimensions (Length x Diameter) 尺寸 (长度*直径)	223.6 x 70 mm (8.8" x 2.76") 223.6 x 70 毫米 (8.8 英寸 x 2.76 英寸)
Mounting 支架	1" BSPT female socket
Max. Cable Length 最大电缆长度	25m (82ft) 25 米 (82 英尺)
Warranty 保修	1 year limited warranty 1 年有限质保
Max. allowed vibration level 允许最大震动水平	1.8 ms ⁻²
Approval Standards 认证标准	EN 13611: 2007 7.10.2.2 EN 60068-2-6:2008

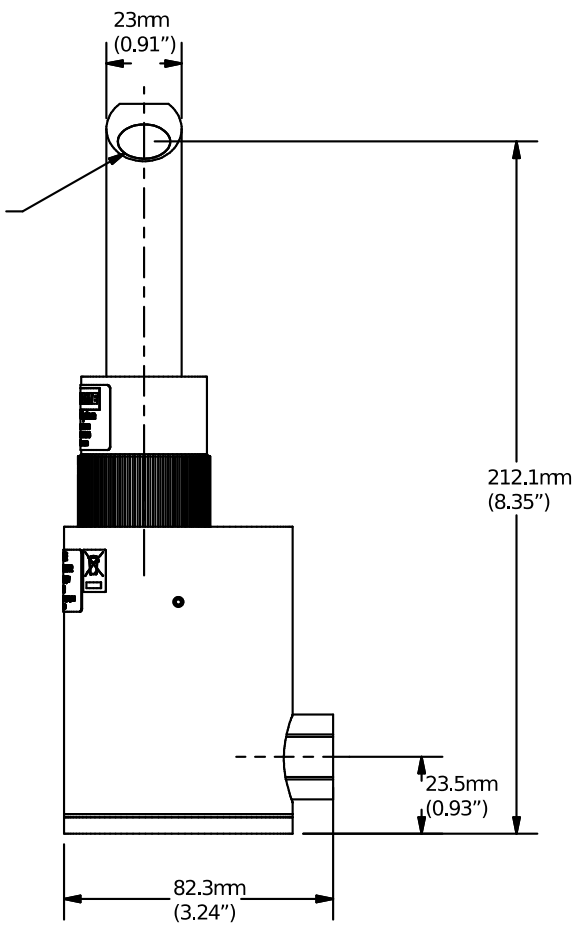
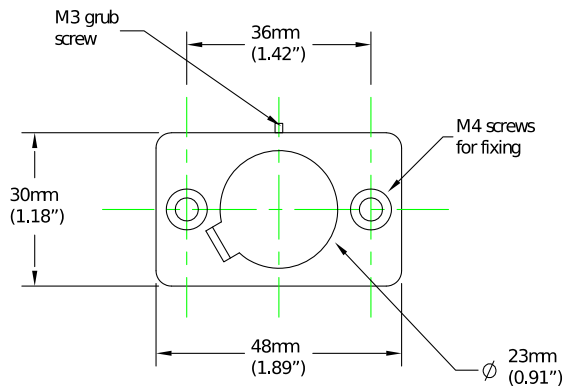
Wiring 接线

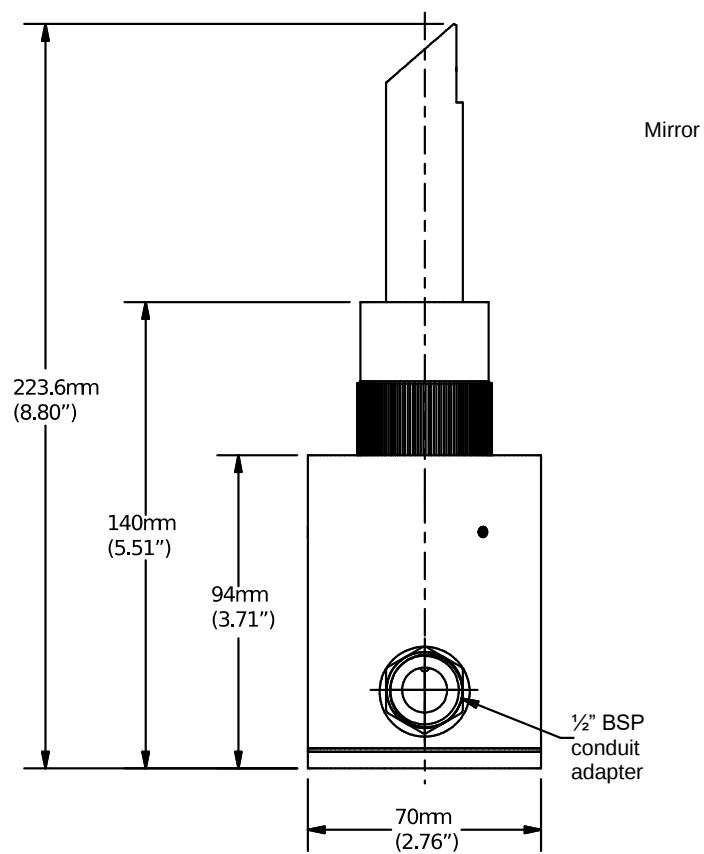
Scanner Terminal 检测器接口		Wire Colour 接线颜色	MM Terminal 控制模块接口
50	0V	Red 红	50
51	300VDC pulse 300 伏直流脉冲	Blue 蓝	51
21	Shutter drive 挡光板驱动	Yellow 黄	21
22	Shutter drive 挡光板驱动	Green 绿	22
-	-	Screen 屏蔽线	S

LED Colour LED 颜色	Flashing Checks 闪烁检查
Red 红	UV Detection 紫外线检测
Yellow 黄	Shutter Operation 快门操作



Dimensions 尺寸





1.3. MM80004 - Standard, Side View UV Scanner (Mk8 Series) MM80004 - 标准，侧视紫外线检测器(Mk8 系列)

This is a side view UV scanner, standard sensitivity, featuring a compact design, higher ingress protection level and built-in flying lead. This UV scanner features:

这是一个侧视紫外线检测器，标准灵敏度，具有紧凑的设计，较高的 IP 级别和自带接线。这款紫外线检测器的特点是：

- Compact tube design to allow for easier installation. The housing is CNC machined from a single piece of Aluminium and houses all the internal components including the PCB and the UV sensor.
新的紧凑管设计，便于安装。外壳是一块铝由 CNC 加工而成，内部组件包括 PCB 和 UV 传感器。
- The Quartz flame viewing lens is press-fitted into a heavy duty, high temperature resistant industrial seal. The seal and lens are then press-fitted into the housing, providing a complete seal between the lens and the housing. This offers high temperature resistance and protection from ingress of external elements such as oil, water, moisture, dust, etc. into the UV scanner.
石英火焰观察镜片装入重型、耐高温工业密封圈。密封圈和镜片压入外壳，确保晶片和外壳之间的完整密封。镜片耐高温并隔离外部成分，如：油，水，水分，灰尘等进入 UV 火检。
- The seal design features a double sealing lip arrangement with one primary sealing lip and a dust protection lip. It is made from industrial-type rubber (Nitrile Rubber – NBR) with a metal casing (Carbon Steel) which imparts the rigidity and strength required of the seal.
密封设计的特点是一个主要密封唇和一个防尘唇的双唇密封装置，它是由工业橡胶(丁腈橡胶-NBR)与金属外壳(碳钢)，赋予刚性和强度所需的密封。
- 1.5 metre fixed flying lead, pre-wired from high-quality 2 core screened cable connected to the UV scanner body through a PG11 gland, offering superior water, moisture and dust protection.
1.5 米固定接线，预先布线为标准，高质量的 2 芯屏蔽电缆通过 PG11 密封压盖连接到 UV 火检，提供优越的防水，防潮和防尘保护。



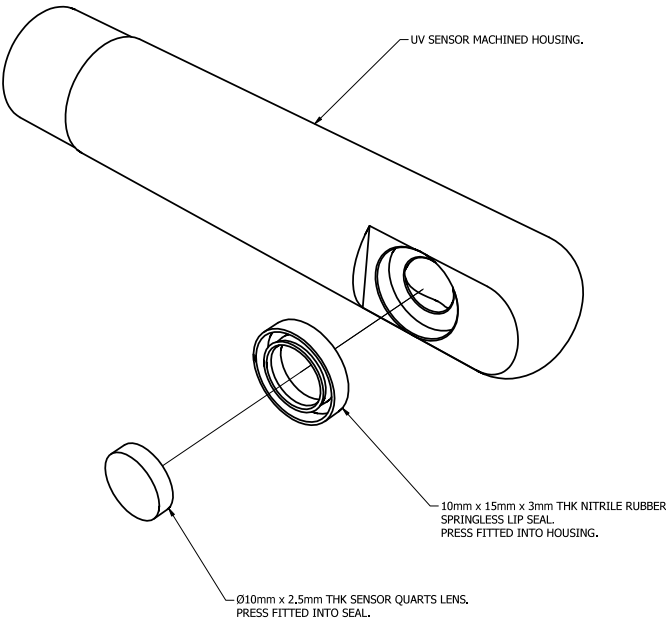
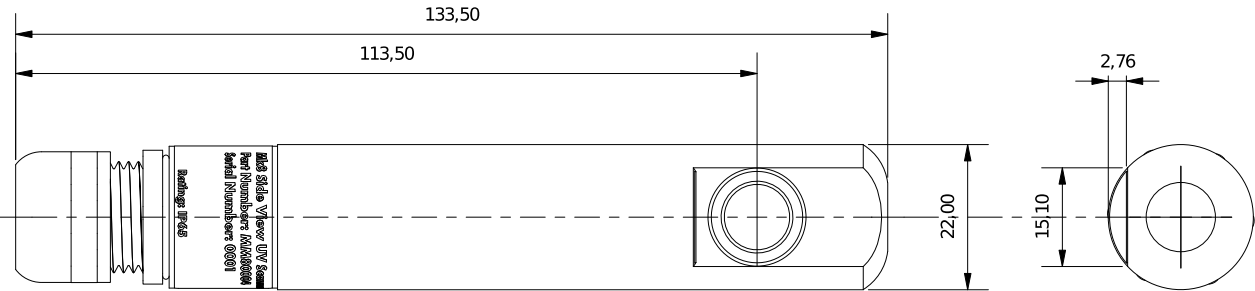
Specifications 规格

Part Number 产品号	MM80004
Flame Detection Technology 火焰检测技术	UV 紫外线
Lens Angle 镜片角度	90.00° - Side view (侧视图)
Sensitivity Level 敏感度水平	Standard 标准
Self-Check 自检	-
Max. Flame Detection Distance 最大火焰检测距离	500mm (20") 500 毫米 (20 英寸)
Max. Operating Temperature* 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating IP 等级	65
NEMA Rating NEMA 等级	4
Housing Material 外壳材料	Aluminium 铝
Lead Included 包括接线	1.5 m (5 ft) 1.5 米 (6 英尺)
Cable Gland 电缆格兰头	PG11
Power Consumption 功率消耗	0.5W – Powered by MM 0.5W – 控制模块驱动
Mounting 支架	Any orientation. Lens must be in direct view of flame 任何方向, UV 镜片必须直接对准火焰
Compatible With 兼容产品	Mk8 MM, Mini Mk8 MM
Dimensions (Length x Diameter) 尺寸 (长度*直径)	133.5 x 22 mm (5.26" x 0.87") 133.5 x 22 毫米 (5.26 英寸 x 0.87 英寸)
Mounting 支架	Mounting clip included 附带安装夹片
Max. Cable Length 最大电缆长度	25m (82ft) 25 米 (82 英尺)
Warranty 保修	1 year limited warranty 1 年有限质保
Max. allowed vibration level 允许最大震动水平	1.8 ms ⁻²

Wiring 接线

Wire Colour 接线颜色		MM Terminal 控制模块接口	
0V	Blue 蓝		50
300V DC Pulse 300 V 直流脉冲	Red 红		51
-	Screen 屏蔽层		S

Dimensions 尺寸



1.4. MM60004 - Standard, Side View UV Scanner**MM60004 - 标准, 侧视紫外线检测器****Specifications 规格**

Part Number 产品号	MM60004
Flame Detection Technology 火焰检测技术	UV 紫外线
Lens Angle 镜片角度	90.00° - Side view (侧视图)
Sensitivity Level 敏感度水平	Standard 标准
Self-Check 自检	-
Max. Flame Detection Distance 最大火焰检测距离	500mm (20") 500 毫米 (20 英寸)
Max. Operating Temperature* 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating IP 等级	54
NEMA Rating NEMA 等级	3
Housing Material 外壳材料	Aluminium 铝
Lead Included 包括接线	-
Cable Gland 电缆格兰头	PG11 to 1/2" conduit adaptor PG11 到半英寸管道适配器
Power Consumption 功率消耗	0.5W – Powered by MM 0.5W – 控制模块驱动
Mounting 支架	Any orientation. Lens must be in direct view of flame 任何方向, UV 镜片必须直接对准火焰
Compatible With	Mk8 MM, Mini Mk8 MM, Mk7 MM, Mk6 MM.

兼容产品

Dimensions (Length x Diameter)	165.7 x 57 mm (6.52" x 2.24")
尺寸 (长度*直径)	165.7 x 57 毫米 (6.52 英寸 x 2.24 英寸)

Mounting 支架	Bracket included 包括支架
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Max. Cable Length	25m (82ft)
最大电缆长度	25 米 (82 英尺)

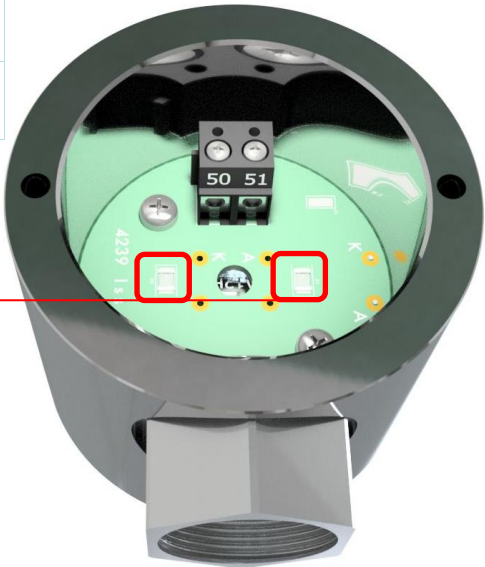
Warranty 保修	1 year limited warranty 1 年有限质保
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Max. allowed vibration level	1.8 ms ⁻²
允许最大的震动水平	

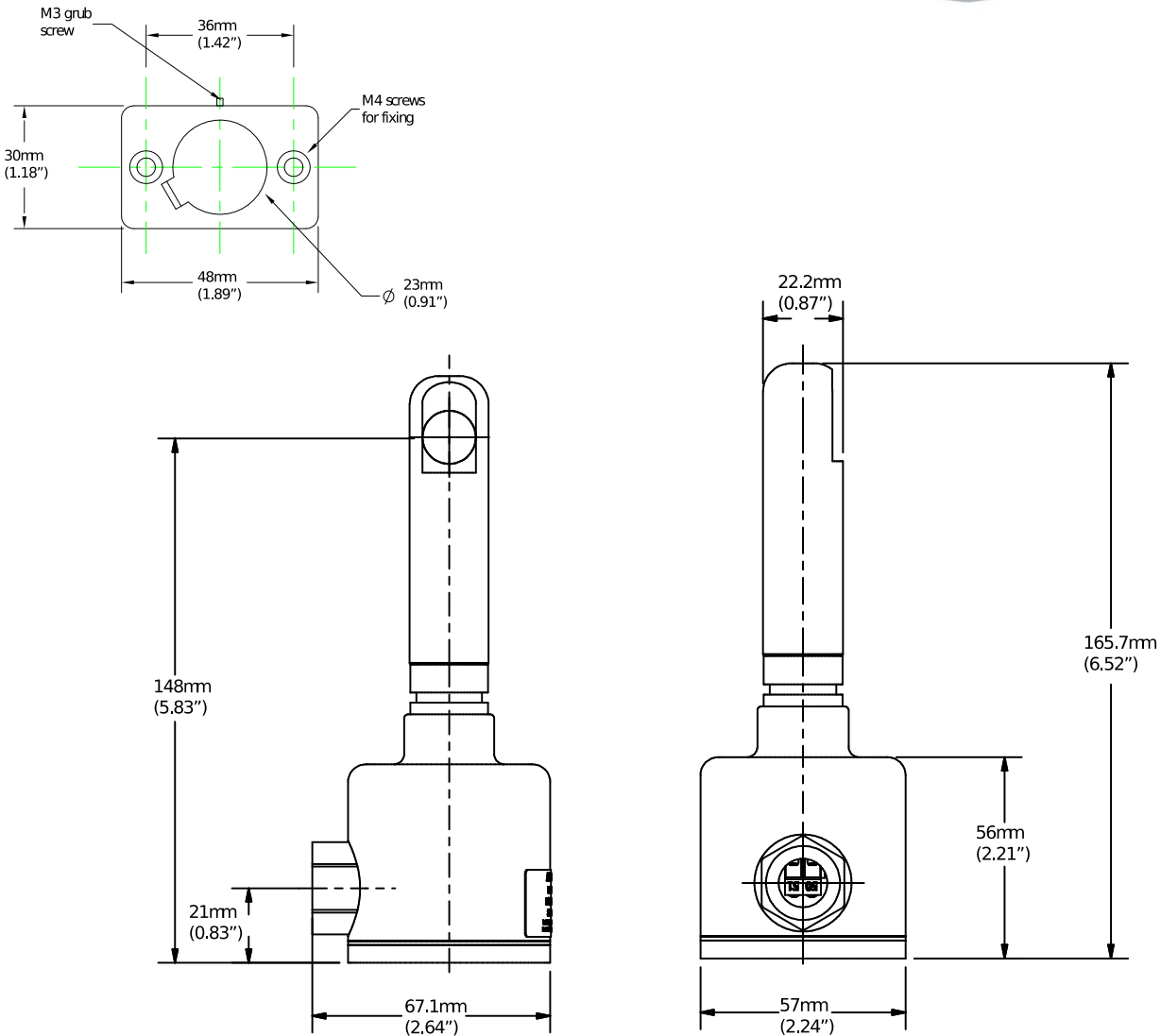
Wiring 接线

Scanner Terminal 检测器接口		Wire Colour 接线颜色	MM Terminal 控制模块接口
50	0V	Blue 蓝	50
51	300VDC Pulse 300 伏直流脉冲	Red 红	51
-	-	Screen 屏蔽层	S

LED Colour LED 颜色	Flashing Checks 闪烁检查
Red 红	UV Detection 紫外线检测



Dimensions 尺寸



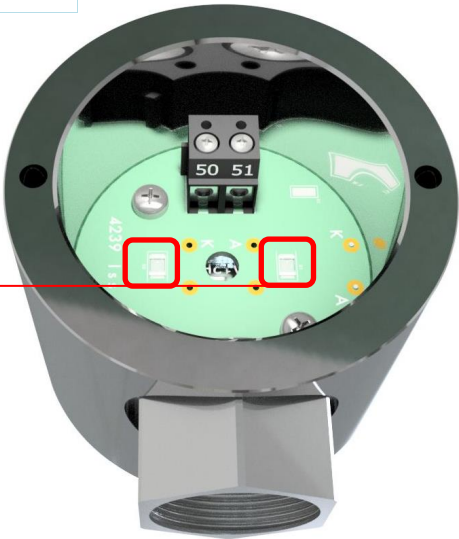
1.5. MM60004/U - Standard, End View UV Scanner**MM60004/U - 标准, 端视紫外线检测器****Specifications 规格**

Part Number / 产品号	MM60004/U
Flame Detection Technology 火焰检测技术	UV 紫外线
Lens Angle 镜片角度	00.00° - End view (端视图)
Sensitivity Level 敏感度水平	Standard 标准
Self-Check 自检	Yes 是的
Max. Flame Detection Distance 最大火焰检测距离	500mm (20") 500 毫米 (20 英寸)
Max. Operating Temperature* 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating / IP 等级	54
NEMA Rating / NEMA 等级	3
Housing Material / 外壳材料	Aluminium 铝
Lead Included / 包括主线	-
Cable Gland 电缆格兰头	PG11 to ½" conduit adaptor PG11 到半英寸管道适配器
Power Consumption 功率消耗	0.5W – Powered by MM 0.5W – 控制模块驱动
Mounting 安装支架	Any orientation. Lens must be in direct view of flame 任何方向, UV 镜片必须直接对准火焰
Compatible With / 兼容产品	Mk8 MM, Mini Mk8 MM, Mk7 MM, Mk6 MM.
Dimensions (Length x Diameter) 尺寸 (长度*直径)	108 x 57 mm (4.26" x 2.24") 108 x 57 毫米 (4.26 英寸 x 2.24 英寸)
Mounting 支架	1/2" NPT socket 1/2 " NPT 插座
Max. Cable Length / 最大电缆长度	25m (82ft)
Warranty 保修	1 year limited warranty 1 年有限质保
Max. allowed vibration level 允许最大震动水平	1.8 ms ⁻²

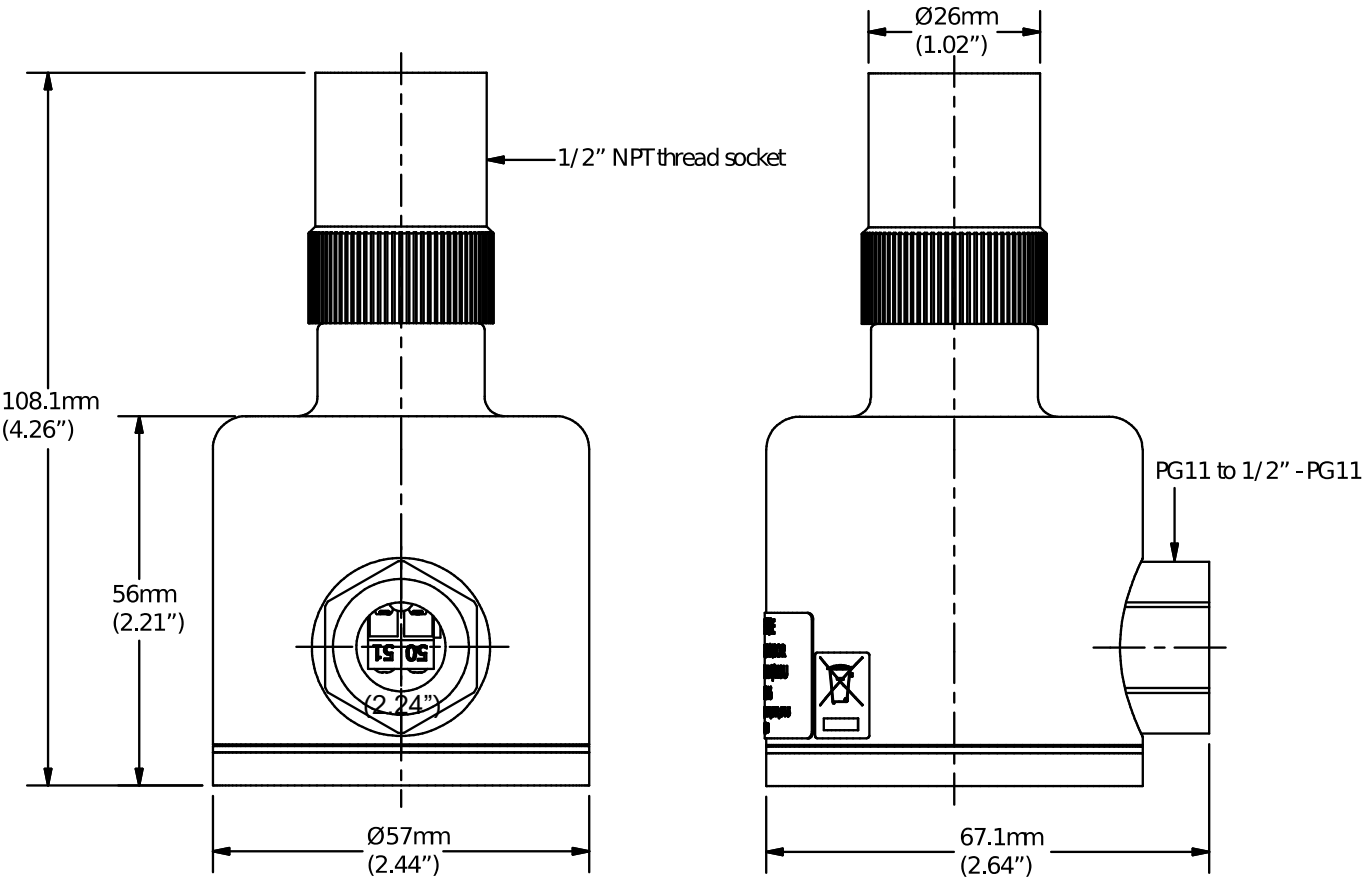
Wiring 接线

Scanner Terminal 检测器接口		Wire Colour 接线颜色	MM Terminal 控制模块接口
50	0V	Blue 蓝	50
51	300VDC Pulse 300 伏直流脉冲	Red 红	51
-	-	Screen 屏蔽层	S

LED Colour LED 颜色	Flashing Checks 闪烁
Red 红	UV Detection 紫外线检测



Dimensions 尺寸



1.6. MM60004/HSU - Standard, High Sensitivity, End View UV Scanner MM60004/HSU - 标准, 高灵敏度, 端视紫外线检测器



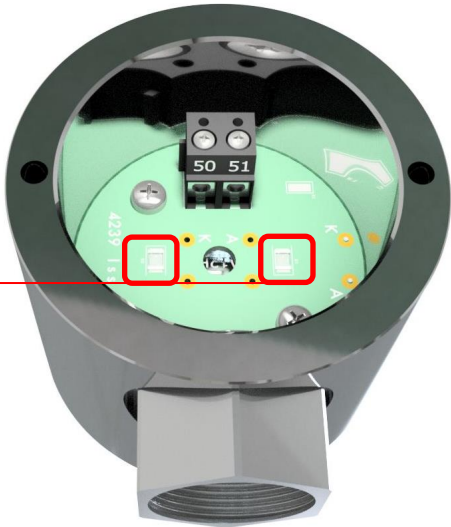
Specifications 规格

Part Number 产品号	MM60004/HSU
Flame Detection Technology 火焰检测技术	UV 紫外线
Lens Angle 镜片教徒	00.00° - End view (端视图)
Sensitivity Level 敏感度水平	High Sensitivity 高敏感度
Self-Check 自检	-
Max. Flame Detection Distance 最大火焰检测距离	1,500mm (60") 1500 毫米 (60 英寸)
Max. Operating Temperature* 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating / IP 等级	54
NEMA Rating / NEMA 等级	3
Housing Material / 外壳材料	Aluminium 铝
Lead Included / 包括接线	-
Cable Gland 电缆格兰头	PG11 to ½" conduit adaptor PG11 到半英寸管道适配器
Power Consumption 功率消耗	0.5W – Powered by MM 0.5W – 控制模块驱动
Mounting 支架	Any orientation. Lens must be in direct view of flame 任何方向, UV 镜片必须直接对准火焰
Compatible With 兼容产品	Mk8 MM, Mini Mk8 MM, Mk7 MM, Mk6 MM.
Dimensions (Length x Diameter) 尺寸 (长度*直径)	108 x 57 mm (4.26" x 2.24") 108 x 57 毫米 (4.26 英寸 x 2.24 英寸)
Mounting 支架	1/2" NPT socket 1/2 " NPT 插座
Max. Cable Length / 最大电缆长度	25m (82ft)
Warranty / 保修	1 year limited warranty 1 年有限质保
Max. allowed vibration level 允许最大震动水平	1.8 ms-2

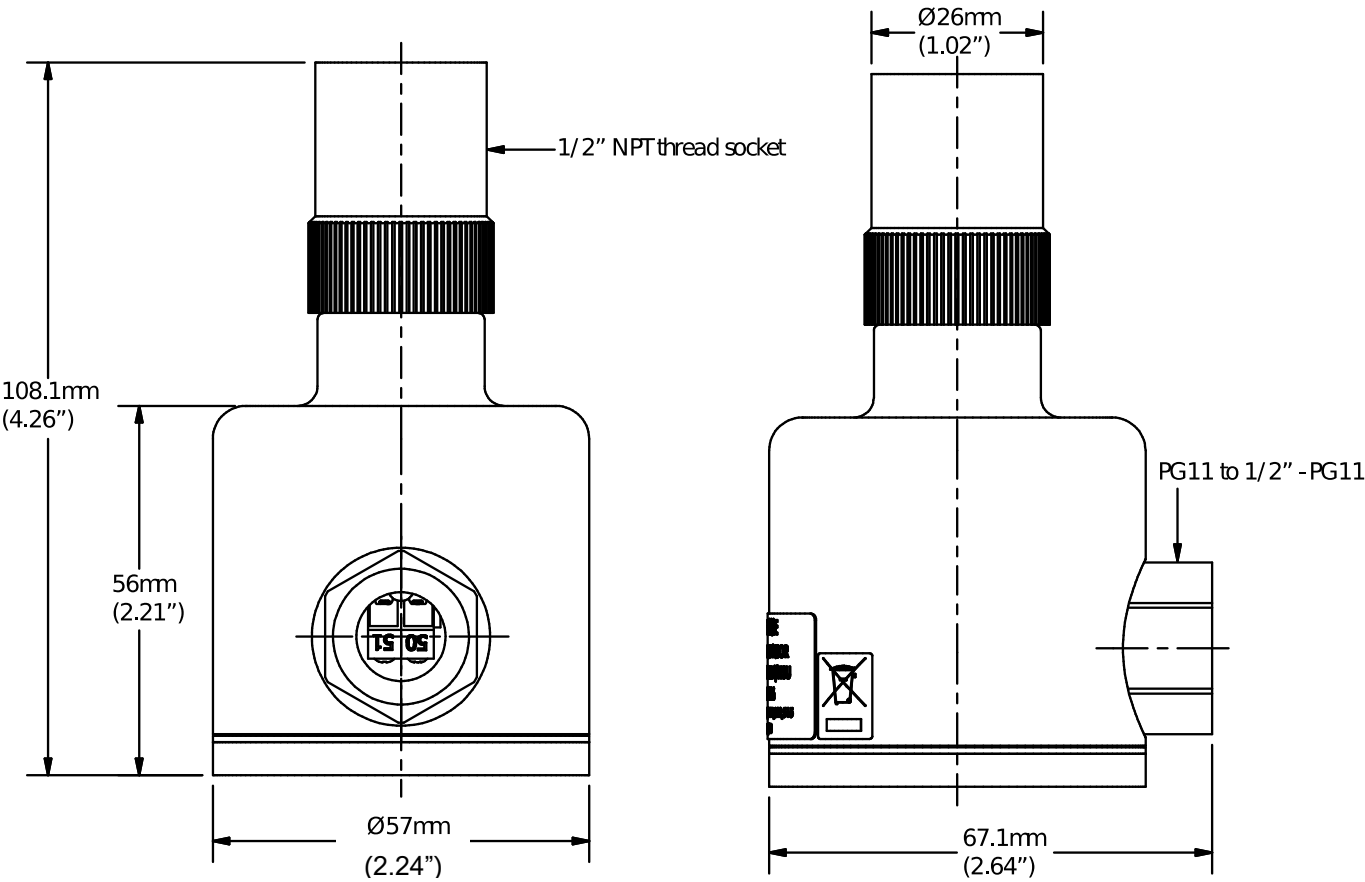
Wiring 接线

Scanner Terminal 检测器接口		Wire Colour 接线颜色	MM Terminal 控制模块接口
50	0V	Blue 蓝	50
51	300VDC Pulse 300 伏直流脉冲	Red 红	51
-	-	Screen 屏 幕	S

LED Colour LED 颜色	Flashing Checks 闪烁检查
Red 红	UV Detection 紫外线检测



Dimensions 尺寸



1.7. MM60004/U/EXP - Standard, End View UV Scanner, ATEX Approved MM60004/U/EXP - 标准, 端视紫外线检测器, ATEX 认证

For use in Hazardous Environment where Explosion Proof, ATEX approved equipment is required.
在防爆的危险环境中使用, 需要 ATEX 认证的设备。



Specifications 规格

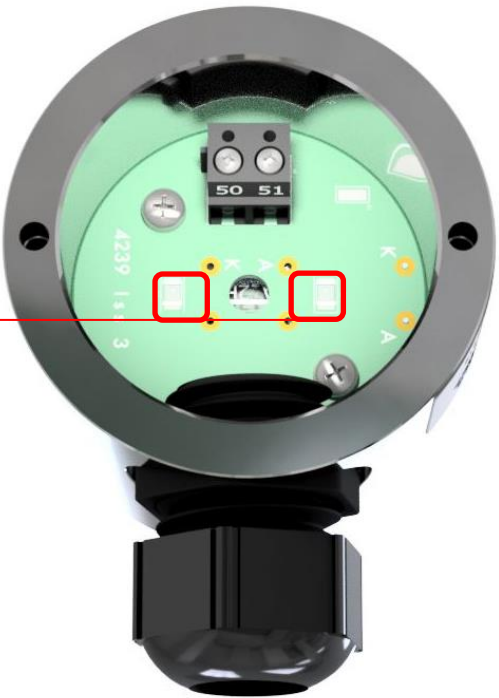
Part Number 产品号	MM60004/U/EXP
Flame Detection Technology 火焰检测技术	UV 紫外线
Lens Angle 镜片角度	00.00° - End view (端视图)
Sensitivity Level 敏感度水平	Standard 标准
Self-Check 自检	-
Max. Flame Detection Distance 最大火焰检测距离	500mm (20") 500 毫米 (20 英寸)
Max. Operating Temperature* 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating IP 等级	54
NEMA Rating NEMA 等级	3
Housing Material 外壳材料	Aluminium 铝
Lead Included 包括主线	-
Cable Gland 电缆格兰头	ATEX M20 cable gland ATEX M20 电缆接头
Power Consumption 功率消耗	0.5W – Powered by MM 0.5W – 控制模块驱动
Mounting	Any orientation. Lens must be in direct view of flame

支架	任何方向，UV 镜片必须直接对准火焰
Compatible With 兼容产品	Mk8 MM, Mini Mk8 MM, Mk7 MM, Mk6 MM.
Dimensions (Length x Diameter) 尺寸 (长度*直径)	108 x 57 mm (4.26" x 2.24") 108 x 57 毫米 (4.26 英寸 x 2.24 英寸)
Mounting 支架	1/2" NPT socket 1/2" NPT 插座
Max. Cable Length 最大电缆长度	25m (82ft) 25 米 (82 英尺)
Warranty 保修	1 year limited warranty 1 年有限质保
Max. allowed vibration level* 允许最大震动水平	1.8 ms ⁻²
Standards 标准	EN 60079-0:2012, EN 60079-15:2010
Classification 分类等级	II 3 G Ex nAc IIC Gc T4

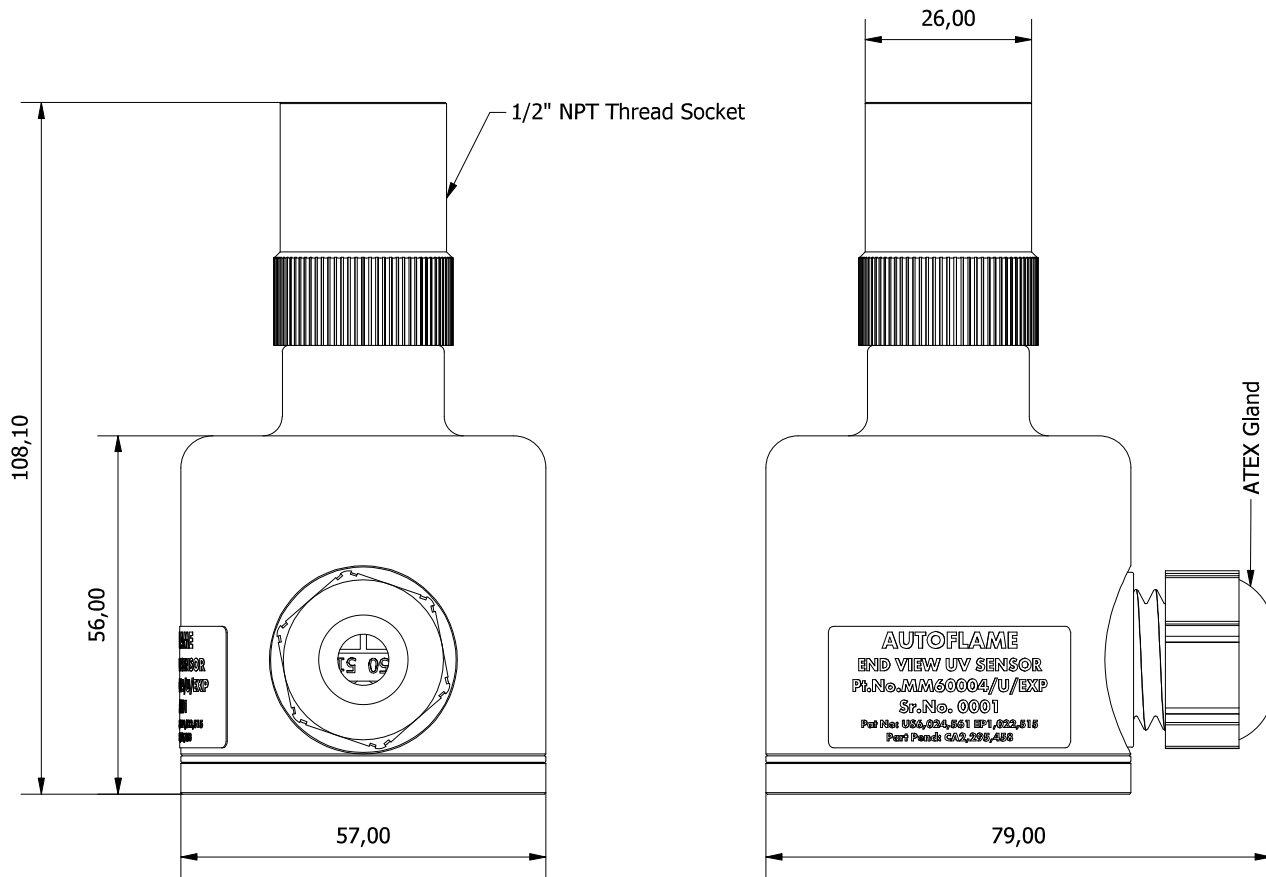
Wiring 接线

Scanner Terminal 检测器接口		Wire Colour 接线颜色	MM Terminal 控制模块接口
50	0V	Blue 蓝	50
51	300VDC Pulse 300 伏直流脉冲	Red 红	51
-	-	Screen 屏幕	S

LED Colour LED 颜色	Flashing Checks 闪烁检查
Red 红	UV Detection 紫外线检测



Dimensions 尺寸



1.8. MM60003/HS/EXP - Self-Check, High Sensitivity, End View UV Scanner, ATEX Approved

MM60003/HS/EXP - 自检，高灵敏度，端视紫外线检测器，ATEX 认证

For use in Hazardous Environment where Explosion Proof, ATEX approved equipment required.
用于危险的防爆环境，需要 ATEX 认证的设备。



Specifications 规格

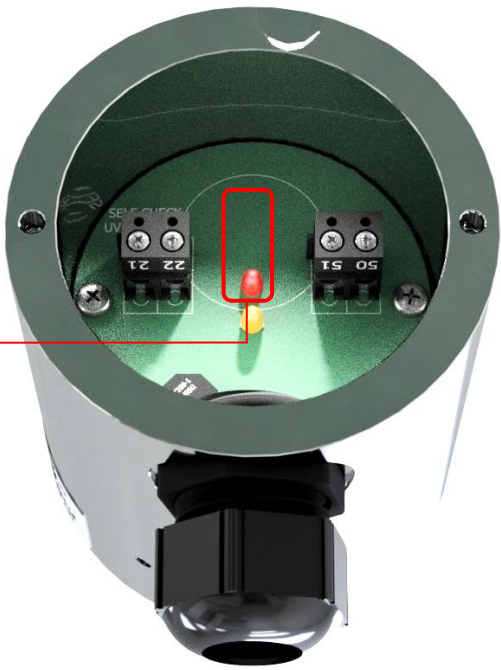
Part Number 产品号	MM60003/HS/EXP
Flame Detection Technology 火焰检测技术	UV 紫外线
Lens Angle 镜片角度	0.00° - End view (端视)
Sensitivity Level 敏感度水平	High 高
Self-Check 自检	Mechanical Shutter 机械快门
Max. Flame Detection Distance 最大火焰检测距离	1,500mm (60") 1500 毫米 (60 英寸)
Max. Operating Temperature* 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating IP 等级	54
NEMA Rating NEMA 等级	3
Housing Material 外壳材料	Aluminium 铝
Lead Included 包括接线	-
Cable Gland	ATEX M20 cable gland

电缆格兰头	ATEX M20 电缆格兰头
Power Consumption	0.5W – Powered by MM
功率消耗	0.5W – 控制模块驱动
Mounting	Any orientation. Lens must be in direct view of flame
支架	任何方向，UV 镜片必须直接对准火焰
Compatible With	Mk8 MM, Mini Mk8 MM, Mk7 MM, Mk6 MM.
兼容产品	
Dimensions (Length x Diameter)	140 x 70 mm (5.51" x 2.76")
尺寸 (长度*直径)	140 x 70 毫米 (5.51 英寸 x 2.76 英寸)
Mounting	1" BSPT female socket
支架	1 寸 BSPT 螺母插座
Max. Cable Length	25m (82ft)
最大电缆长度	25 米 (82 英尺)
Warranty	1 year limited warranty 1 年有限质保
保修	
Max. allowed vibration level	1.8 ms ⁻²
允许最大震动水平	
Standards	EN 60079-0:2012, EN 60079-15:2010
标准	
Classification	II 3 G Ex nAc IIC Gc T4
分类等级	

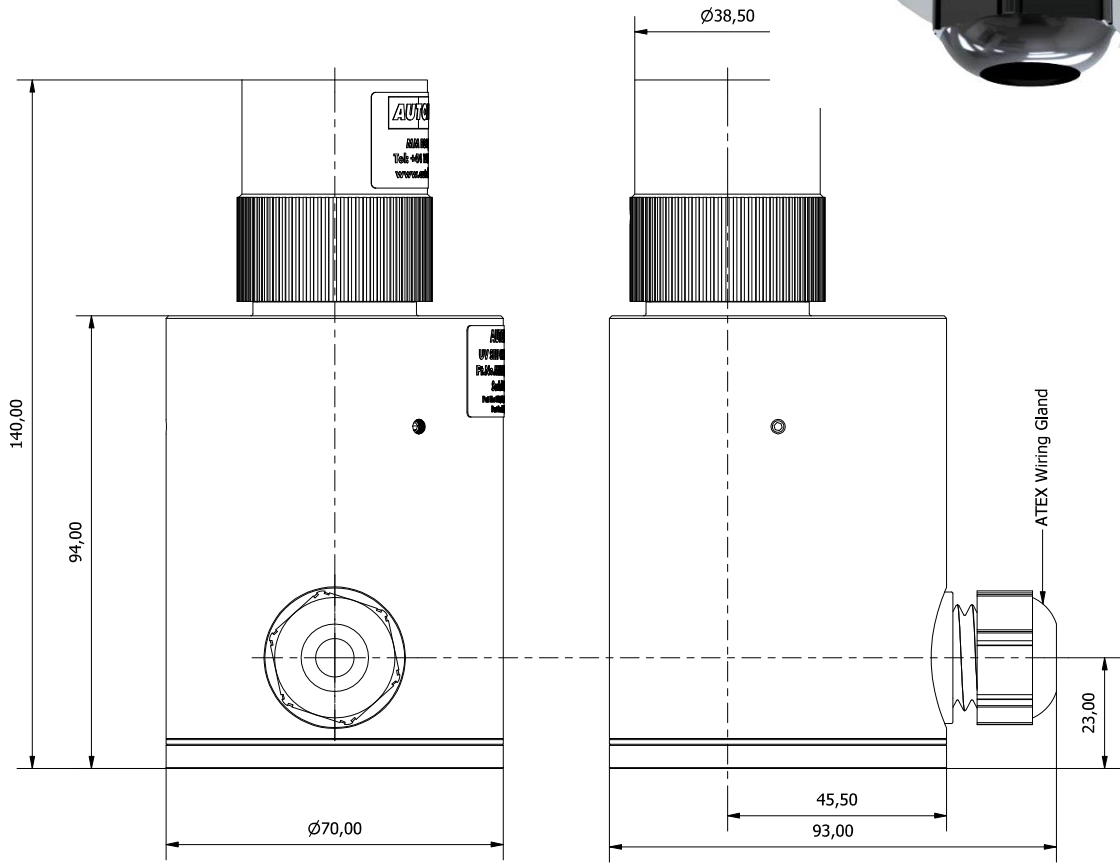
Wiring 接线

Scanner Terminal 检测器接口		Wire Colour 接线颜色	MM Terminal 控制模块接口
50	0V	Red 红	50
51	300VDC pulse 300 伏直流脉冲	Blue 蓝	51
21	Shutter drive 挡光板驱动	Yellow 黄	21
22	Shutter drive 挡光板驱动	Green 绿	22
-	-	Screen 屏蔽层	S

LED Colour LED 颜色	Flashing Checks 闪烁检查
Red 红	UV Detection 紫外线检测
Yellow 黄	Shutter Operation 挡光板操作



Dimensions 尺寸



2. **IR Flame Scanners**

红外线火焰检测器

Infrared (IR) flame scanners monitor the infrared spectral band for flame flicker given off by hot combustion gases.

红外(IR)火焰检测器监测由热燃烧气体发出的红外光谱波段的火焰闪烁。

IR scanners are most suitable for liquid fuels including Diesel, Kerosene, Heavy Fuel Oil, Light Fuel Oil, Biodiesel, Methanol and many others. However they can also be used for most gaseous fuels.

红外检测器最适用于液体燃料，包括柴油、煤油、重油、轻油、生物柴油、甲醇等。然而，它们也可以用于大多数气体燃料。

The IR sensors feature a self-check function installed that allows for over 72 hours of uninterrupted operation. 红外传感器具有自检功能，可连续工作 72 小时以上。

The following IR scanners are available:

可使用以下红外检测器:

Part # 产品号	View 视角
MM70017	End View 端视角
MM80017	End View 端视角
MM80017/SV	Side View 侧视角

Note: Excessive vibration and heat can considerably reduce the lifespan of the flame scanner

注: 过高的振动和热量会大大减少火焰检测器的寿命

Standards: EN 54-10, EN 54-17

标准: EN 54-10, EN 54-17

2.1. MM70017 - Self-Check, High Sensitivity, End View IR Scanner

MM70017 - 自检，高灵敏度，端视红外线检测器

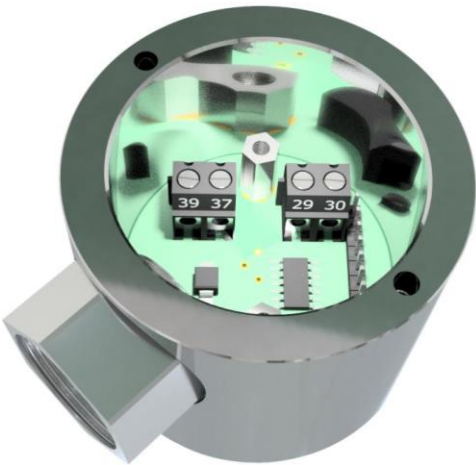


Specifications 规格

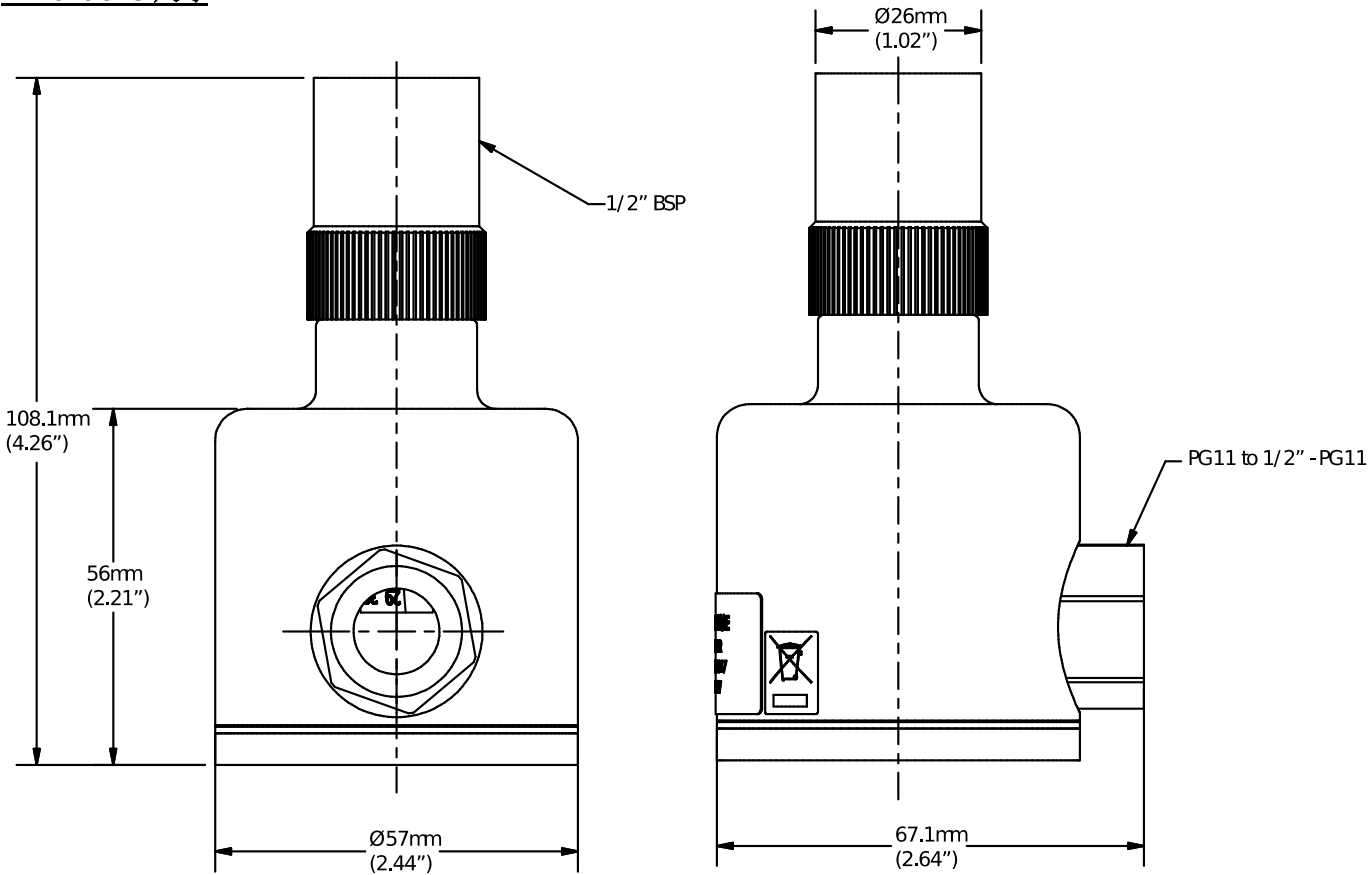
Part Number 产品号	MM70017
Flame Detection Technology 火焰检测技术	IR – InfraRed 红外线
Lens Angle / 镜片角度	00.00° - End view (端视)
Sensitivity Level / 敏感度水平	High Sensitivity 高敏感度
Self-Check / 自检	Electronic check 电子检查
Max. Flame Detection Distance 最大火焰检测距离	1,500mm (60") 1500 毫米 (60 英寸)
Max. Operating Temperature* 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating / IP 等级	54
NEMA Rating / NEMA 等级	3
Housing Material / 外壳材料	Aluminium 铝
Lead Included / 包括接线	-
Cable Gland 电缆格兰头	PG11 to ½" conduit adaptor PG11 到半英寸管道适配器
Mounting 支架	Any orientation. Lens must be in direct view of flame 任何方向，UV 镜片必须直接对准火焰
Compatible With / 兼容产品	Mk8 MM, Mini Mk8 MM, Mk7 MM, Mk6 MM.
Dimensions (Length x Diameter) 尺寸 (长度*直径)	108 x 67 mm 108 x 67 毫米
Mounting 支架	1/2" BSPT socket ½英寸 BSPT 插座
Max. Cable Length 最大电缆长度	25m (82ft /英寸)
Warranty / 保修	1 year limited warranty / 1 年有限质保
Max. allowed vibration level 允许最大震动水平	1.8 ms ⁻²
Standards / 标准	EN 54-10, EN 54-17

Wiring 接线

Scanner Terminal 检测器端口		Wire Colour 接线颜色	MM Terminal 控制模块端口
29	Serial - 序列 -	Yellow 黄	29
30	Serial + 序列 +	Green 绿	30
37	0V	Blue 蓝	48
38	15VDC supply 15 伏直流电	Red 红	49
-	-	Screen 屏蔽层	S



Dimentions 尺寸



2.2. MM80017 - Self-Check, End View IR Scanner

MM80017 - 自检，端视 红外检测器



Specifications 规格

Part Number 产品号	MM80017
Flame Detection Technology 火焰检测技术	IR – InfraRed 红外线
Lens Angle 镜片角度	0.00° - End view (端视)
Sensitivity Level 敏感度水平	Standard 水平
Self-Check 自检	Electronic Check 电子检查
Max. Flame Detection Distance 最大火焰检测距离	1000mm (40") 1000 毫米 (40 英寸)
Minimum Sensed Flame (flicker rate) 最小感应到的火焰 (闪烁频率)	12/second 12/秒
Maximum Sensed Flame (flicker rate) 最大感应到的火焰(闪烁频率)	100/second 100/秒
Flame Failure Detection Time (max) 火焰失效检测时间(最大)	500ms 500 毫秒
Max. Operating Temperature* 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating IP 等级	65
NEMA Rating NEMA 等级	4
Housing Material 外壳材料	Aluminium 铝
Lead Length 接线长度	1.5m (5ft) 1.5 米 (5 英尺)

Cable Gland 电缆格兰头	PG11 built-in. PG11 内置
Mounting 支架	Any orientation. Lens must be in direct view of flame 任何方向，UV 镜片必须直接对准火焰
Compatible With 兼容产品	Mk8 MM, Mini Mk8 MM, Mk7 MM
Dimensions (Length x Diameter) 尺寸 (长度*直径)	133.5 x 22mm 133.5 x 22 毫米
Mounting 支架	Must be mounted using the included bracket with magnetic activator 必须使用附带磁性激活器的支架安装
Max. Cable Length 最大的电缆长度	25m (82ft) 25 米 (82 英尺)
Warranty 保修	1 year limited warranty 1 年有限质保
Max. allowed vibration level 允许最大振动水平	1.8 ms ⁻²
Standards 标准	BS EN 298 2012

Mounting 安装支架

The IR flame scanner can be mounted in any orientation within the burner housing, the only requirement being that it has an unobstructed view of the flame.

红外火焰检测器可以安装在燃烧器外壳内的任何方向，唯一的要求是它可以畅通无阻地看到火焰。

The IR flame scanner features a magnetic reed switch to cut power to the scanner if it is removed from the burner as required by BS EN 298 2012. The supplied mounting fixture contains the magnets necessary to activate the reed switch allowing power to the scanner.

根据 BS EN 298 2012 的要求，红外火焰检测器有一个磁簧开关，可以切断检测器的电源。所提供的安装夹具包含激活簧片开关所需的磁铁，以便为检测器供电。

Grooves in the housing indicate the two zones (see drawings) within which the visible edge of the mounting bracket must sit in for the magnets to be activated.

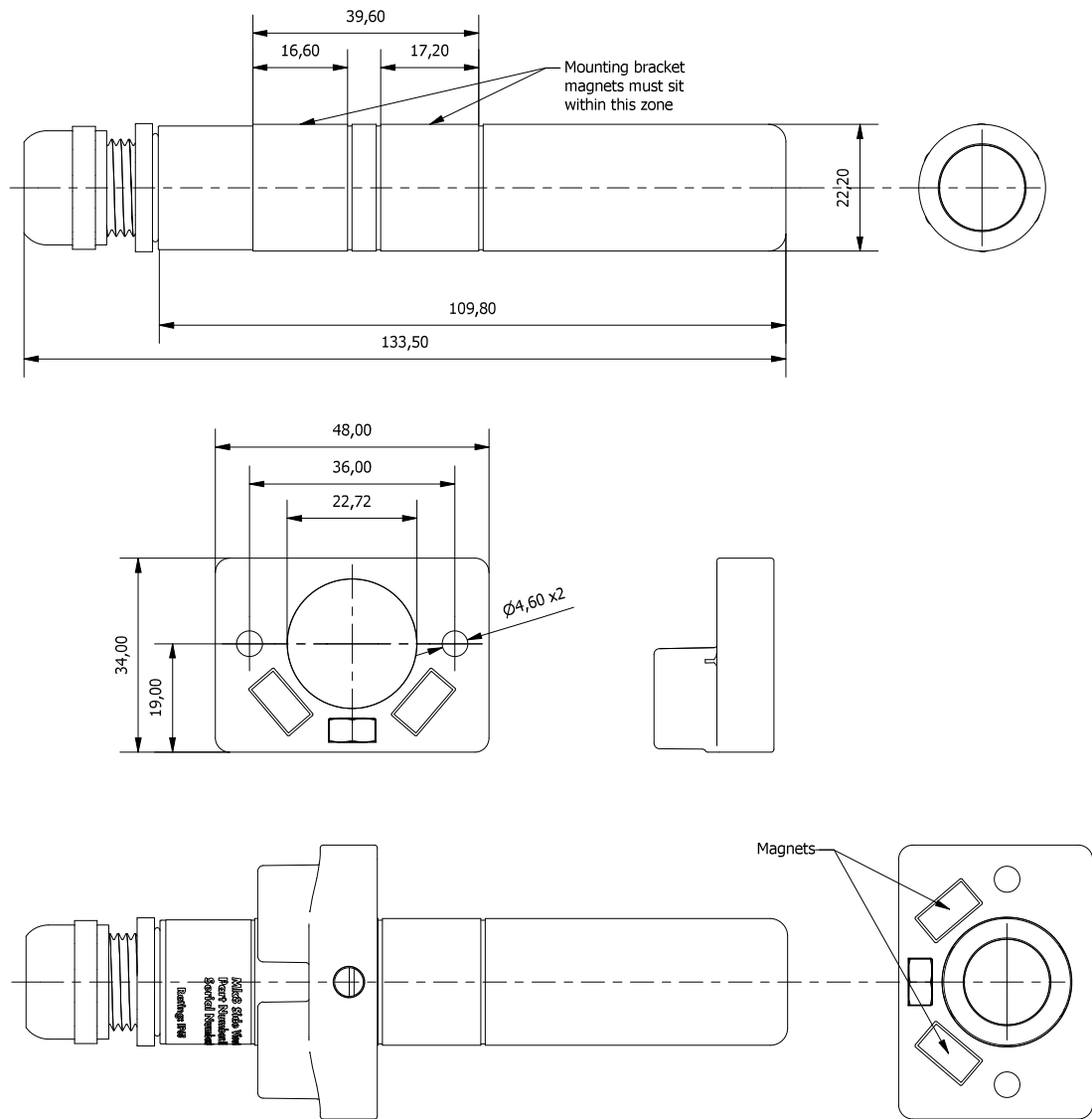
外壳上的凹槽表示两个区域(参见图纸)，安装支架的可见边缘必须位于该区域内，以便磁铁被激活。

Wiring 接线

Scanner terminal 检测器端口	Wire Colour 接线颜色	MM Terminal 控制模块端口
Serial – 序列-	Yellow 黄	29
Serial + 序列+	Green 绿	30
0V	Blue 蓝	48
15VDC supply 15 伏特直流电 供电	Red 红	49
Screen 屏蔽层	Black 黑	S

Technical Drawings 技术图纸





2.3. MM80017/SV - Self-Check, Side View IR Scanner MM80017/SV - 自检, 侧视红外线检测器



Specifications 规格

Part Number 产品号	MM80017/SV
Flame Detection Technology 火焰检测技术	IR – InfraRed 红外线
Lens Angle 镜片角度	90.00° - Side view (侧视)
Sensitivity Level 敏感度水平	Standard 标准
Self-Check 自检	Electronic Check 电子检查
Max. Flame Detection Distance 最大火焰检测距离	1000mm (40") 1000 毫米 (40 英寸)
Minimum Sensed Flame (flicker rate) 最小感应到的火焰(闪烁速率)	12/second 12/秒
Maximum Sensed Flame (flicker rate) 最大感应到的火焰(闪烁速率)	100/second 100/秒
Flame Failure Detection Time (max) 火焰失效检测时间(最大)	500ms 500 毫秒
Max. Operating Temperature* 最大操作温度	60°C (140°F)
Min. Operating Temperature 最小操作温度	0°C (32°F)
IP Rating IP 等级	65
NEMA Rating NEMA 等级	4
Housing Material 外壳材料	Aluminium 铝
Lead length 接线长度	1.5m (5ft) 1.5 米 (5 英尺)
Cable Gland 接线格兰头	PG11 built-in. PG11 内置

Mounting 安装支架	Any orientation. Lens must be in direct view of flame 任何方向，UV 镜片必须直接对准火焰
Compatible With 兼容产品	Mk8 MM, Mini Mk8 MM, Mk7 MM
Dimensions (Length x Diameter) 尺寸 (长度*直径)	133.5 x 22mm 133.5 x 22 毫米
Mounting 安装支架	Must be mounted using the included bracket with magnetic activator 必须使用附带磁性激活器的支架安装
Max. Cable Length 最大电缆长度	25m (82ft) 25 米 (82 英尺)
Warranty 保修	1 years limited warranty 1 年有限质保
Max. allowed vibration level 允许最大振动水平	1.8 ms ⁻²
Standards 标准	BS EN 298 2012

Mounting 安装支架

The IR flame scanner can be mounted in any orientation within the burner housing, the only requirement being that it has an unobstructed view of the flame.

红外火焰检测器可以安装在燃烧器外壳内的任何方向，唯一的要求是它可以畅通无阻地看到火焰。

The IR flame scanner features a magnetic reed switch to cut power to the scanner if it is removed from the burner as required by BS EN 298 2012. The supplied mounting fixture contains the magnets necessary to activate the reed switch allowing power to the scanner.

根据 BS EN 298 2012 的要求，红外火焰检测器有一个磁簧开关，可以切断检测器的电源。所提供的安装夹具包含激活簧片开关所需的磁铁，以便为检测器供电。

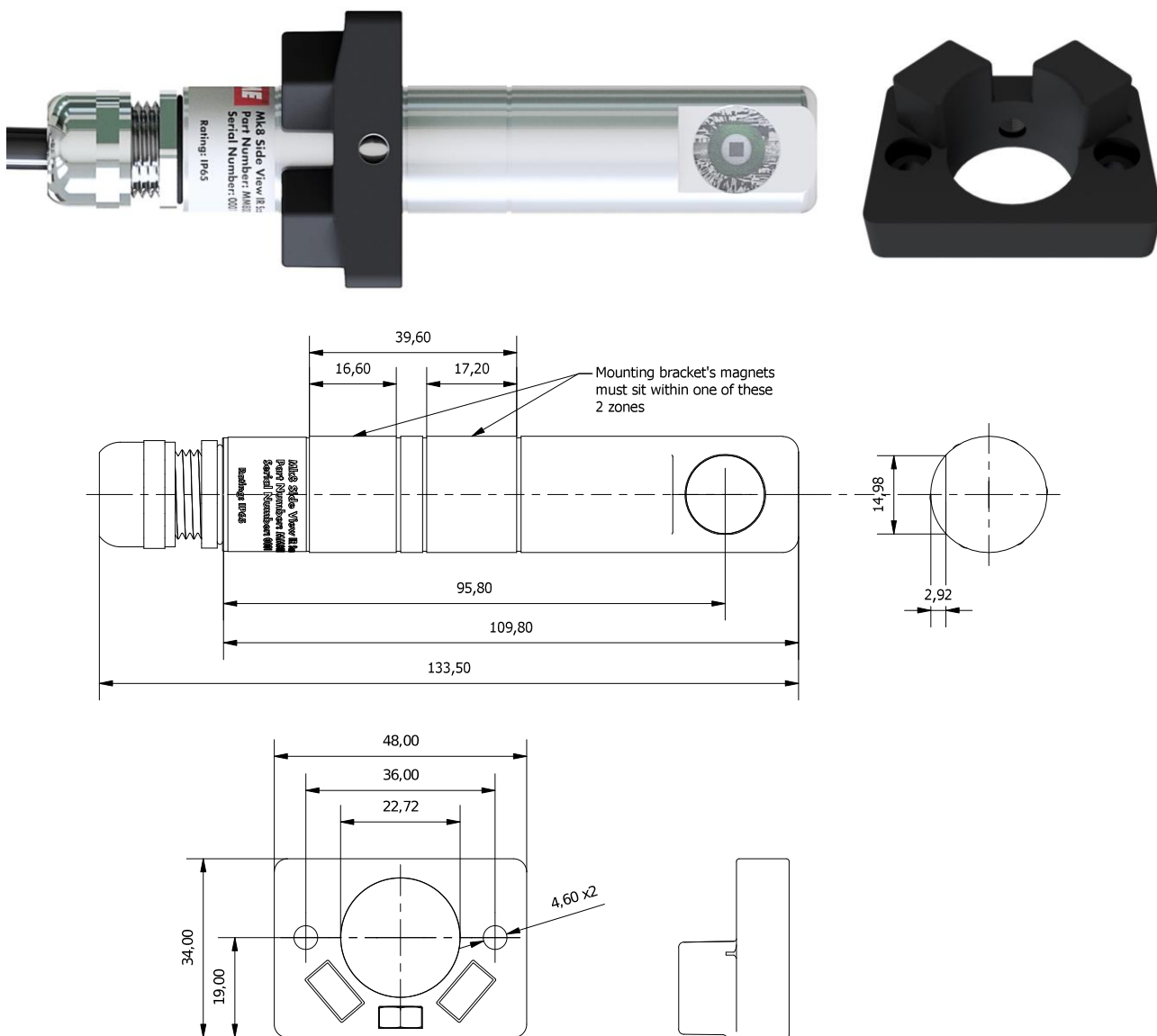
Grooves in the housing indicate the two zones (see drawings) within which the visible edge of the mounting bracket must sit in for the magnets to be activated.

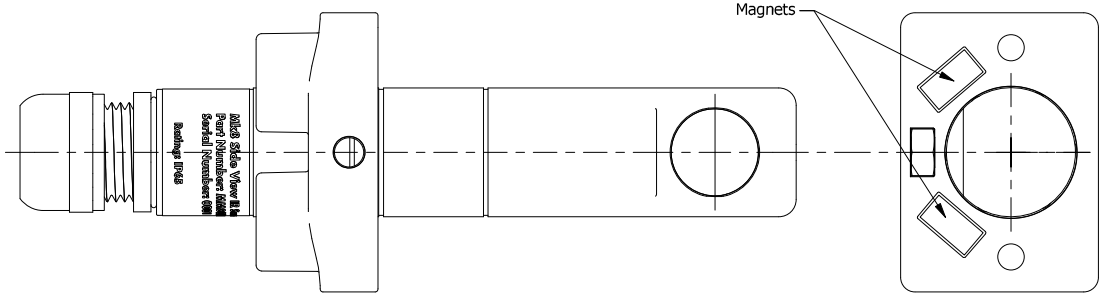
外壳上的凹槽表示两个区域(参见图纸)，安装支架的可见边缘必须位于该区域内，以便磁铁被激活。

Wiring 接线

Scanner 检测器	Wire Colour 接线颜色	MM Terminal 控制模块端口
Serial – 序列-	Yellow 黄	29
Serial + 序列+	Green 绿	30
0V	Blue 蓝	48
15VDC supply 15 伏特直流电 供电	Red 红	49
Screen 屏蔽层	Black 黑	S

Dimensions 尺寸

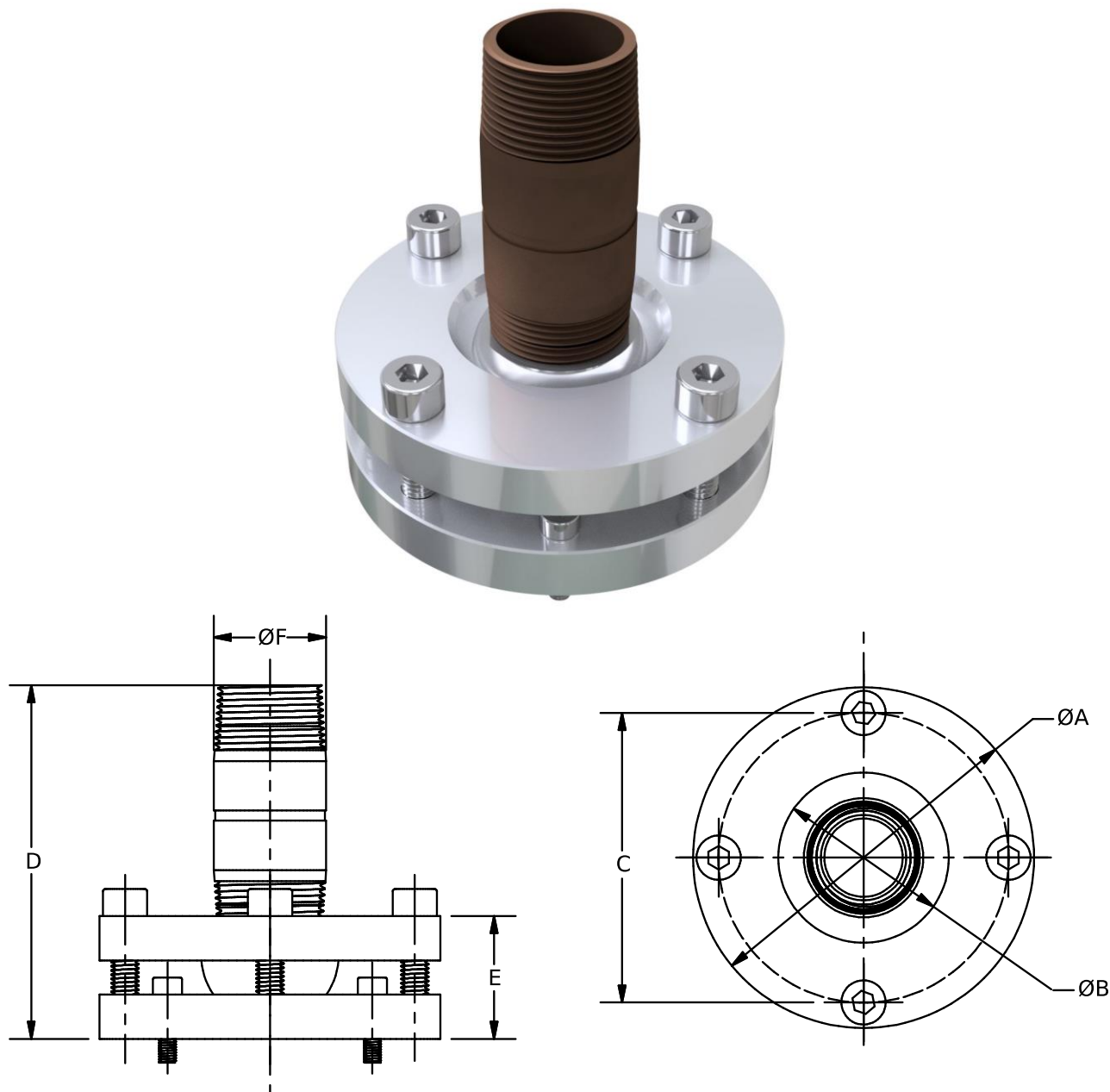




3. **Swivel Mount for Flame Scanners** **火焰检测器的旋转支架**

The swivel mount assembly can be used to optimise the positioning of the end view flame scanners. It can help to position the scanner in direct view of the flame and therefore can improve flame detection. The ball joint design allows the scanner to be positioned at any direction up to $\pm 60^\circ$ and enables 360° positioning of the scanner.

旋转安装组件可以用来优化端视火焰检测器。它可以帮助定位检测器以直视火焰，因此可以提高火焰检测。滚珠接头的设计允许检测器定位在任何方向，最高可达 $\pm 60^\circ$ 度，并允许检测器 360° 度定位。



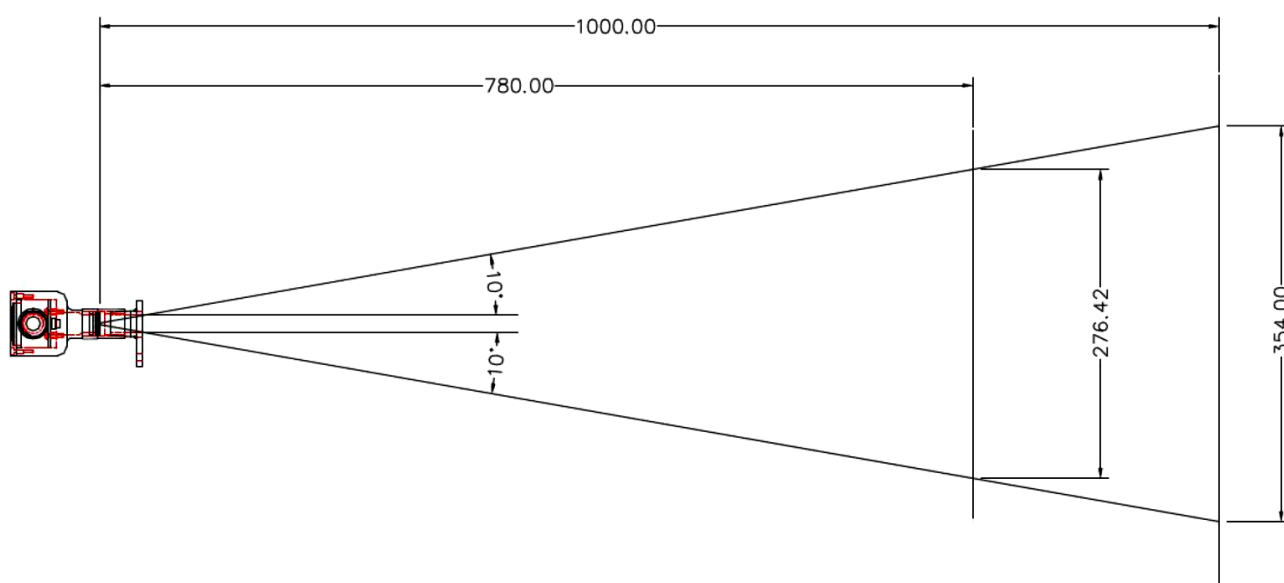
		Swivel mount 1" UVM60003 选装支架 1 寸 UVM60003	Swivel mount 0.5" UVM60004 旋转支架 0.5 寸 UVM60004
Used with 使用型号		MM60003/HS	MM60004/U MM60004/HSU MM70017
Dimensions: mm (inch) 尺寸:毫米 (英寸)	A	100 (3.94)	100 (3.94)
	B	50 (1.97)	50 (1.97)
	C	85 (3.35)	85 (3.35)
	D	104 (4.09)	86 (3.37)
	E	36 (1.42)	36 (1.42)
	F	33 (1.30)	26 (0.99)

4. **Flame Scanners Installation & Operation** **火焰检测器的安装和操作**

4.1. **UV Flame Scanner Installation** **紫外线火焰检测器安装**

The distance between the UV scanner and the flame depends on the shape (width) of the flame. The figure below shows the variation of the maximum allowed distance with the shape of the flame for a standard UV scanner.

紫外线检测器和火焰之间的距离取决于火焰的形状(宽度)。下图显示了标准紫外线检测器的火焰形状随最大允许距离的变化。



Standard Sensitivity UV scanners can be used if the distance from the UV scanner to the flame is no greater than 500mm (20"). High sensitivity UV scanner is recommended if the distance from the UV scanner to the flame exceeds 500mm (20").

如果从紫外检测器到火焰的距离不大于 500 毫米(20 英寸)，可以使用标准灵敏度的紫外检测器。如果从紫外线检测器到火焰的距离超过 500 毫米(20 英寸)，建议使用高灵敏度紫外线检测器。

The following considerations must be taken into consideration when selecting a UV scanner for a specific system setup:

在为特定的系统设置选择紫外线检测器时，必须考虑以下因素：

- Flame size.
火焰尺寸。
- Flame shape (dependent on the burner used).
火焰形状 (取决于使用的燃烧器)。
- Flame intensity (a function of flame size and shape and fuel used).
火焰强度(火焰大小、形状和使用的燃料的函数)。
- Flame obstructions – the scanner must have direct view of the flame.
火焰障碍物-检测器必须能直接看到火焰。

The maximum safe distance a UV scanner can be from a flame is dependent on:

紫外线检测器与火焰的最大安全距离取决于:

- The intensity of UV radiation emitted from the main flame and pilot flame
主火焰和引导火焰发出的紫外线辐射强度
- The geometry of the combustion chamber and available space
燃烧室的几何形状和可用空间

This will vary between applications but the maximum distance possible between a high sensitivity scanner and the flame should not exceed 1500mm (5ft), and between a standard sensitivity UV scanner and the flame should not exceed 500 mm (20")

这在不同的应用场合会有所不同，但是高灵敏度检测器和火焰之间的最大距离不应超过 1500 毫米(5 英寸)，标准灵敏度紫外线检测器和火焰之间的最大距离不应超过 500 毫米(20 英寸)。

The above information is based on the results of tests conducted using a laboratory pilot flame supplied from a Bunsen burner of flame size 100x20mm.

以上信息是基于使用火焰大小为 100x20 毫米的一个 Bunsen 燃烧器提供的实验室先导火焰进行的测试结果。

The length of the cable connecting the UV scanner to the MM should not be longer than 25m (82ft).

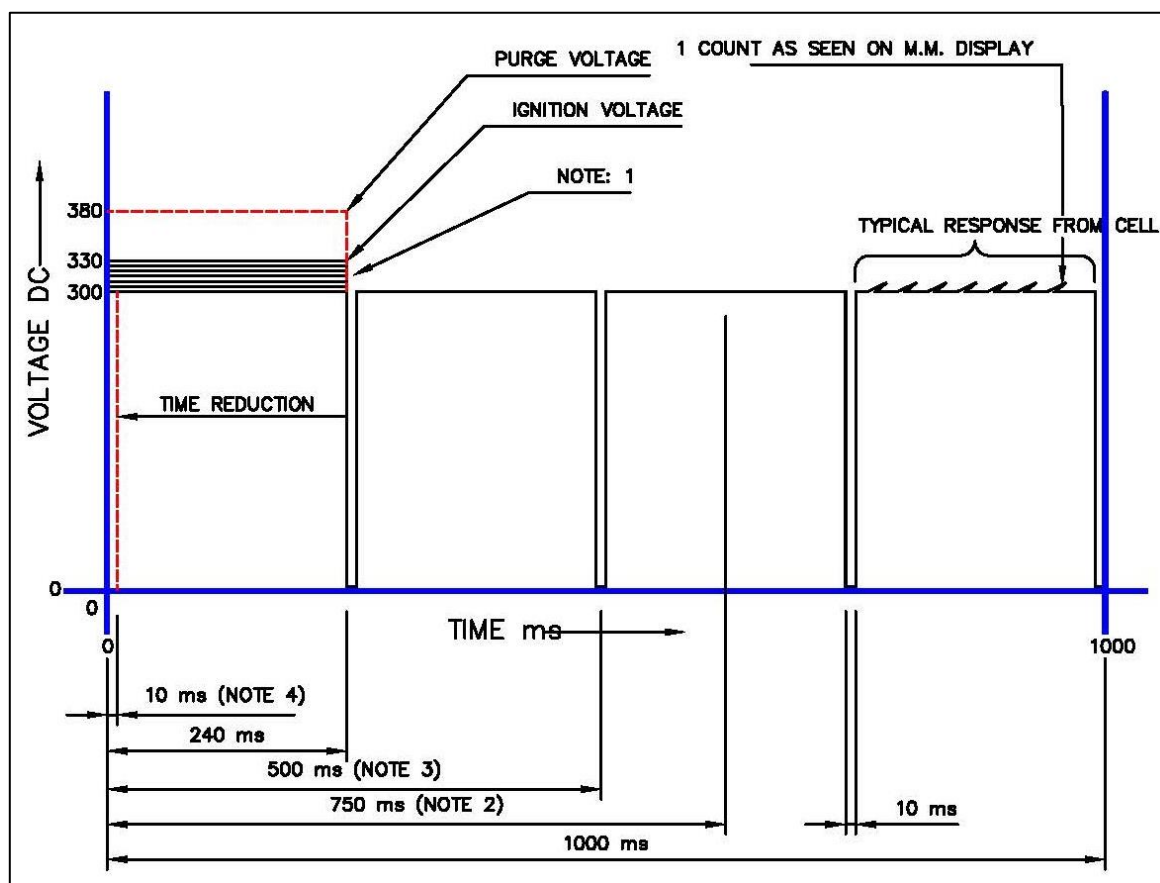
连接紫外线检测器和控制模块的电缆长度不应超过 25 米(82 英尺)。

If the UV scanner is wired incorrectly, a limited UV signal will be detected but the LED will not illuminate.

如果紫外线检测器的接线不正确，将会检测到有限的紫外线信号，但发光二极管不会发光。

4.2. UV Flame Scanner Operation

紫外线火焰检测器操作



UV Scanner Signal Timing Diagram

紫外线检测器信号时序图

After the first safety time, voltage is reduced by 5 volts every 500ms. Providing the flame signal is above the UV setpoint. If below the UV threshold, voltage will remain at 330 volts. The voltage will not increase during main flame operation.

在第一安全时间后，电压每 500 毫秒降低 5 伏。如果火焰信号高于紫外线设定值。如果低于紫外线阈值，电压将保持在 330 伏。主火焰运行时电压不会升高。

If 5 counts or less have been detected over any 730ms period, the system will invoke a lockout. A short circuit between the two wires connected to the UV would produce 3 counts or less. This is the reason for nominating 5 counts as the lockout level.

如果在 730 毫秒期间内检测到 5 个计数或更少，系统将调用锁定。连接紫外线的两根电线之间的短路将产生 3 次或更少的计数。这是提名 5 计数作为锁定水平的原因。

During normal operation, 300 volts would be applied for a 240ms period after the second safety time. This is providing the UV signal is above the UV setpoint which is set at 25 counts. The setpoint cannot be adjusted.

在正常运行时，在第二安全时间后施加 300 伏电压周期 240 毫秒。这是在紫外线信号高于设置为 25 计数的紫外线设定值的情况下。该设定值无法调整。

If the UV count is above 25 counts then the time voltage is applied to the UV sensor is decreased by 1ms every 500ms. This time is reduced until a maximum of 10ms has been reached. This helps preserve the life of the UV scanner as the time that voltage is applied to the scanner is reduced dramatically.

如果紫外线计数超过 25 计数，则施加在紫外线传感器上的时间电压每 500 毫秒降低 1 毫秒。这个时间会减少，直到达到 10 毫秒的最大值。这有助于延迟紫外线检测器的使用寿命，因为应用电压到检测器上的时间大幅降低。

Every 500ms the recorded counts are averaged and displayed on the MM screen.

每 500 毫秒记录的计数取平均值并显示在控制模块屏幕上。

When using a self-check scanner the timing reduction resets when the paddle operates.

当使用自检检测器时，当挡板工作时，时间减少会复位。

As the flame is increasing, the UV counts will stabilise at 5 times the UV threshold set in option/parameter 120. As the flame is decreasing, the UV counts will stabilise at 3 times the UV threshold set in option/parameter 120.

当火焰增强时，紫外线计数将稳定在选项/参数 120 中设置的紫外线阈值的 5 倍。当火焰减弱时，紫外线计数将稳定在选项/参数 120 中设置的紫外线阈值的 3 倍。

4.3. IR Flame Scanner Installation

红外线火焰检测器安装

The IR flame scanners incorporate a magnetic reed switch to prohibit their operation if they are removed from the burner. This must be mounted using the supplied bracket which incorporate the required magnet.

红外火焰检测器包含一个磁簧开关，以禁止其操作，如果他们被从燃烧器移除。这必须安装使用提供的支架，其中包括所需的磁铁。

The distance the IR scanner can be positioned from the flame is dependent on:

红外检测器与火焰的距离取决于：

- The intensity of the IR radiation emitted from the pilot flame and main flame.
主火焰和主火焰发出的红外辐射强度。
- The geometry of the combustion chamber and available space.
燃烧室的几何形状和可用空间。

The IR flame scanners are designed to measure the flicker response of the flame and should therefore be aimed towards the outer portion of the flame envelope where the flicker is more prominent.

红外火焰检测器被设计用来测量火焰的闪烁响应，因此应该瞄准火焰包膜的外部部分，那里的闪烁更明显。

Every 500ms the flame scanner outputs the flicker count for the preceding 500ms and the count should be above a threshold of 12 counts/second to indicate flame presence.

火焰检测器每 500 毫秒输出前 500 毫秒的闪烁计数，计数应高于 12 /秒的阈值，以表明火焰存在。

If the count is below that it may be necessary to:

如果计数低于，则可能需要：

- Move the scanner close to the flame or point it more towards the centre if the flame intensity is thought to be low.
如果火焰强度较低，请将检测器靠近火焰或将其指向中心。
- Move the scanner away from the flame if the IR intensity is thought to be too high causing the sensor to be in saturation
如果认为红外强度过高导致传感器处于饱和状态，请将检测器移离火焰。

4.4. IR Flame Scanner Operation

红外线火焰检测器操作

When operating with an MM, the IR flame scanner receives power and outputs a flame pulse count on the data lines. The flame count is the flicker rate of the flame in pulses/second and is output every 500ms. The MM requires to see at least a pulse count of 12 to be certain that there is a flame present.

当与控制模块操作时，红外火焰检测器使用数据线接收电源和输出火焰脉冲计数。火焰计数是火焰的闪烁速率，单位是脉冲/秒，每 500 毫秒输出一次。控制模块需要看到至少一个脉冲计数 12，以确定有火焰存在。

There are a number of errors which the MM may report as follows:

有一些错误，控制模块可能报告如下：

Error 错误	Action 行动
IR Comms Lost 红外通讯丢失	Check the connection of the 4 wires back to the MM to ensure they are made correctly. In addition, this may mean that the magnetic reed switch is not activated so the unit has no power. Check the position of the mounting grooves in relation to the mounting bracket and adjust the unit position as required. 检查回到控制模块的 4 根电线的连接，以确保它们是正确的。此外，这可能意味着磁簧开关没有被激活，因此设备没有电力。检查安装槽相对于安装支架的位置，按要求调整设备位置。
No flame count 没有火焰计数	The scanner cannot detect a flame when one is present. This may be that the view of the flame is obscured from the unit or that the unit is too close, or too far from the flame and signal is therefore saturated or in the noise floor. Alter the position of the scanner relative to the flame and retry. 当有火焰存在时，检测器无法检测到火焰。这可能是设备的火焰的视角被阻碍了，或者设备离火焰太近或太远，信号因此饱和或在噪声水平上。改变检测器相对于火焰的位置，然后重试。
High Ambient IR 高环境红外	The scanner is seeing a varying IR signal when no flame should be present. Check that there are no IR sources within the burner and retry. 当不应该出现火焰时，检测器看到的是一个变化的红外信号。检查燃烧器中是否没有红外源，然后重试。

4.5. Cable Specifications

电缆规格

The cable used for the UV and IR scanners must conform to the following specification:
用于紫外和红外检测器的电缆必须符合以下规范:

- 16/0.2mm PVC insulated overall braid
16/0.2毫米 PVC绝缘整体编织
- Screened
屏蔽
- PVC sheathed
PVC护套
- Sixteen wires per core
每根16线丝
- Diameter of wires in each core: 0.2mm
每根线芯直径:0.2毫米
- Rated at 440V AC rms at 1600Hz
额定交流rms为440V, 1600Hz
- DEF 61-12 current rating per core 2.5A
DEF 61-12电流等级每根线芯2.5安培
- Maximum operating temperature: 70°C (158°F)
最大工作温度:70°C(158°F)
- Nominal conductor area: 0.5sq mm per core
标称导体面积:每芯0.5平方毫米
- Nominal insulation radial thickness on core: 0.45mm
标称绝缘线芯径向厚度:0.45毫米
- Nominal conductor diameter per core: 0.93mm
每线芯标称导体直径:0.93毫米
- Nominal core resistance at 20°C: 40.1Ω/1000m
标称线芯电阻20°C下: 40.1Ω/ 1000米
- Nominal overall diameter per core: 1.83mm
每个线芯的公称总直径:1.83毫米
- Fill factor of braid screen: 0.7
编织网屏蔽层的填充因子:0.7
- Equivalent imperial conductor sizes: 14/0.0076
等效英制导体尺寸:14/0.0076

This cable can be ordered directly from Autoflame using part # CAB50002m - 16-2-2C 2 Core.
这种电缆可以直接从 Autoflame 订购使用部分# CAB50002m - 16-2-2C 2 芯。

UV and IR scanners cable length should not exceed 25m (82ft).
紫外线和红外线检测器电缆长度不应超过 25 米(82 英尺)。

For the self-check scanners, use 2 sets of 2 core cables.
自检检测器, 使用 2 套 2 芯电缆。

5. Mk8 MM Flame Detection Using Flame Switch 使用火焰开关进行 MK8 MM 火焰检测

The Mk8 MM allows an external flame switch for flame detection. Live input terminals 85 and 86 are used to wire the flame switch to the MM. To configure operation with a flame switch on the Mk8 MM, Option / Parameter 122 must be set to 1.

Mk8 MM 允许一个外部火焰开关进行火焰检测。动态输入终端 85 和 86 用于将火焰开关连接到控制模块。要在 Mk8 MM 上配置火焰开关操作，选项/参数 122 必须设置为 1。

The operation of Terminals 85 and 86 must be as follows:

终端 85 和 86 的操作必须如下：

- When the flame switch indicates no flame, the voltage on Terminal 85 must be 0VAC, and the voltage on Terminal 86 must be mains voltage (110/230VAC).
火焰开关指示无火焰时，85 端电压必须为 0VAC，86 端电压必须为电源电压(110/230VAC)。
- When the flame switch indicates the presence of a flame, the voltage on Terminal 85 must be mains voltage (110/230Vac), and the voltage on Terminal 86 must be 0VAC.
当火焰开关显示火焰存在时，终端 85 上的电压必须为电源电压(110/230Vac)，终端 86 上的电压必须为 0VAC。

Terminal 85 is the functional input for detecting the flame while Terminal 86 is solely for the purpose of checking that Terminal 85 is operating correctly.

终端 85 是检测火焰的功能输入，而终端 86 仅用于检查终端 85 是否正常运行。

Terminal 86 must be seen to be the inverse of Terminal 85, i.e. if Terminal 85 is at 0VAC, Terminal 86 must be at mains voltage and if Terminal 85 is at mains voltage, Terminal 86 must be at 0VAC.

86 端子必须是 85 端子的反向，如果 85 端子在 0VAC，86 端子必须为电源电压，如果 85 端子在电源电压，86 端子必须为 0VAC。

If Terminal 86 does not follow the inverse of Terminal 85 'Terminal 86 inverse' lockout will occur.

如果 86 号终端不遵循 85 号终端的反向过程，将会发生 86 号终端反向过程锁定。

Within the MM there is a latency of 250 milliseconds on the monitoring of Terminal 85. To ensure a 1 second overall flame failure response time, it is essential that the response time of the flame switch is set to no more than 750 milliseconds.

在控制模块中，终端 85 的监视有 250 毫秒的延迟。为了确保 1 秒的整体火焰失效响应时间，必须将火焰开关的响应时间设置为不超过 750 毫秒。

Flame switches often provide a volt free changeover contact to indicate the flame status. Alternatively, they may provide a pair of 'inverse' outputs. If the flame switch only provides a single output terminal, a relay will have to be installed between the flame switch and the MM to provide a set of volt free changeover contacts.

火焰开关通常提供一个无电压转换接点，以指示火焰状态。或者，它们可以提供一对“反向”输出。如果火焰开关只提供一个输出端子，继电器将必须安装在火焰开关和控制模块之间，以提供一组无电压转换触点。

6. Mini Mk8 MM Flame Detection Using Ionisation **Mk8 微型控制模块使用电离检测火焰**

As well as using UV or IR, the Mini Mk8 MM supports Ionisation signal / Flame Rod. This can be wired into Terminal 64 and the cable must be screened at the MM side only.

以及使用紫外线或红外线，Mk8 微型控制模块支持电离信号/火焰棒。这可以被连接到终端 64 并且电缆必须仅在控制模块这面接屏蔽层。

When ionisation is optioned on the Mini Mk8 MM, the flame will be signalled when the rectification voltage is above 30V DC, the maximum sensed rectification voltage is 540V DC, above which a Lockout will be generated.

当 Mk8 微型控制模块选择电离时，当整流电压超过 30V 直流时，火焰会发出信号，感知到的最大整流电压为 540V 直流，超过这个电压会产生锁定。

7. **Flame Detection Options / Dual Scanners Operation** **火焰检测器选项/双检测器操作**

The table below shows the flame detection options for the Mk8 MM and Mini Mk8 MM systems. Option / Parameter 122 sets the flame sensor selection options.

下表显示了 Mk8 控制模块和 Mk8 微型控制模块系统的火焰探测选项。

选项/参数 122 设置火焰传感器选择选项。

Flame Detection Option 火焰检测选项	Mk8 MM MK8 控制模块	Mini Mk8 MM Mk8 微型控制模块
UV 紫外线		
Ionisation 电离		
IR 红外线		
IR and UV 红外线和紫外线		
IR and Ionisation 红外线和电离		
Ionisation to UV switchover 电离到紫外线转换		
IR or UV 红外线或紫外线		
IR or Ionisation 红外线或电离		
Flame Switch 火焰开关		

It is not possible to use dual UV scanners or dual IR scanners with the Mk8 MM or Mini Mk8 MM.
不可能使用双紫外检测器或双红外检测器与 Mk8 控制模块或 Mk8 微型控制模块。

When using IR and/or UV scanners, both scanners work independently in detecting a flame signal so it is not required that the two scanners have to read the same flame signal strength.

当使用红外线和/或紫外线检测器时，两个检测器在检测火焰信号时都能独立工作，因此不需要两个检测器读取相同的火焰信号强度。

7.1. **IR and UV, IR and Ionisation** **红外线和紫外线，红外线和电离**

Both flame scanners must detect a flame when there should be and vice versa. If either flame scanner fails to see a flame when there should be a flame, the MM will lockout on no flame signal, even if the other scanner detects the flame. This is the same for simulated flame; only one scanner must see a flame when there should not be for the MM to lockout.

当有火焰时这两个火焰检测器必须都检测到火焰，反之亦然。如果任何一个火焰检测器在应该有火焰的时候没有看到火焰，控制模块将锁定没有火焰信号，即使其他检测器检测到火焰。虚假火焰也是如此；当没有火焰时只要有一个检测器检测到火焰，控制模块锁定。

This mode can give extra safety to the flame detection system by adding a second scanner to verify that the other scanner is detecting the flame correctly in addition to the self-diagnostics built into the MM.

除了内置在控制模块中的自诊断功能外，这种模式还可以通过增加第二个检测器来验证其他检测器是否正确地检测火焰，从而为火焰检测系统提供额外的安全性。

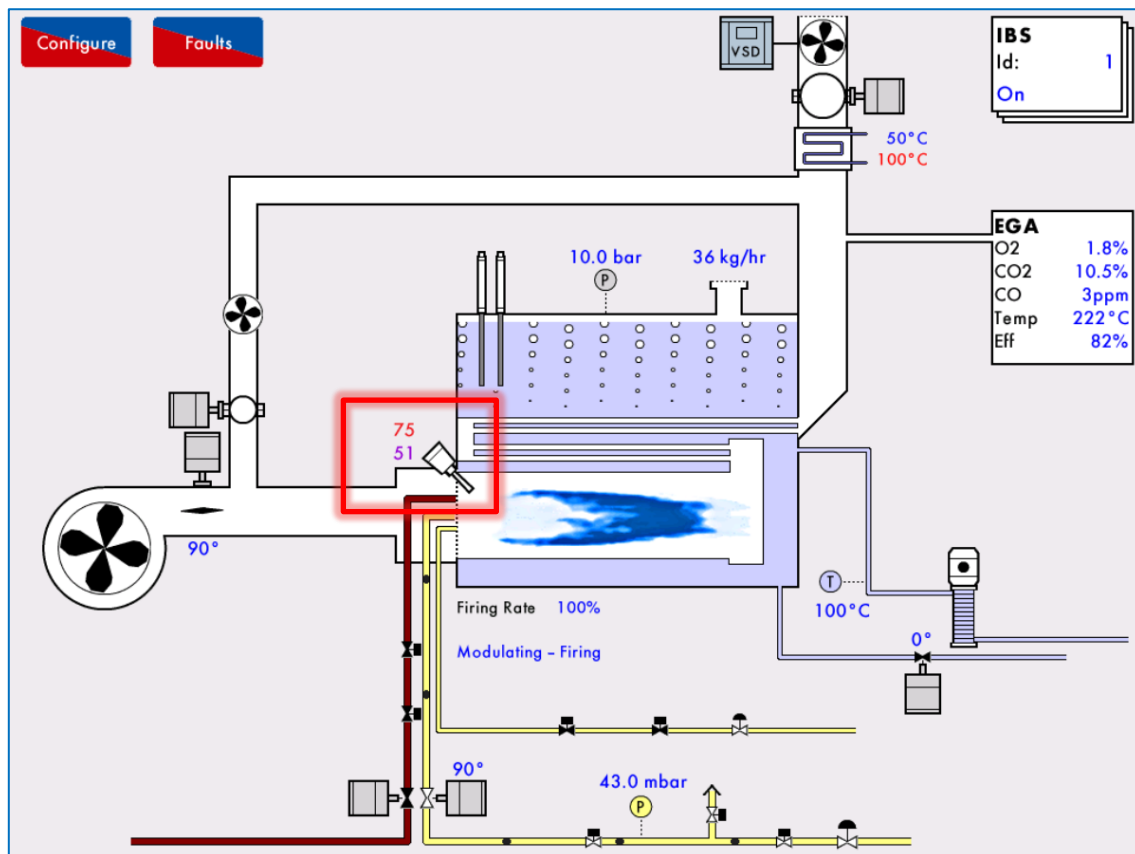
7.2. IR or UV, IR or Ionisation 红外线或紫外线，红外线或电离

Either flame scanner must detect a flame when there should be and vice versa. If one flame scanner fails to see a flame when there should be but the other scanner does detect a flame, then the MM will continue to fire without a lockout. Only if both flame scanners fail to detect the flame when there should be and vice versa, will the MM lockout. This is the same for simulated flame; either or both scanners must see a flame when there should not be, for the MM to lockout.

应该有火焰时，任一火焰检测器必须检测火焰，反之亦然。如果一个火焰检测器没有看到火焰，而另一个检测器检测到火焰，那么控制模块将在没有锁定的情况下继续燃烧。只有当应该有火焰而两个火焰检测器都不能探测火焰时，控制模块锁定，反之亦然。虚假火焰也是如此；不应该有火焰时，任何一个或两个检测器看到火焰时，为控制模块锁定。

This mode can be useful if the system requires 2 flame scanners, for example one for the pilot flame and another one for the main flame.

如果系统需要 2 个火焰检测器，例如一个用于点火焰，另一个用于主火焰，这种模式会很有用。



Main MM screen displays the UV and IR signal strength if both are optional
主控制模块屏幕显示紫外线和红外线信号强度，如果两者都选择

7.3. Ionisation to UV Switchover (Mini Mk8 MM only)

电离到紫外线切换(只限于 Mk8 微型控制模块)

Some burner application requires different flame detection methods for the pilot flame and the main flame. On the Mini Mk8 MM, Ionisation to UV Switchover function can be used, this can be selected by setting option 122 to 7.

一些燃烧器应用需要不同的火焰探测方法，用于引导火焰和主火焰。在 Mk8 微型控制模块上，可以使用电离到紫外线切换功能，这可以通过设置选项 122 到 7 来选择。

An Ionisation / Flame Rod is used to detect the pilot flame and then a UV scanner is used to detect the main flame.

一个电离/火焰棒被用来检测引导火焰，然后一个紫外线检测器被用来检测主火焰。

The pilot type (set in option 111) must be set to interrupted pilot when using Ionisation to UV Switchover.

当使用电离切换到紫外线时，引导火类型(在选项 111 中设置)必须设置为中断式引导。

7.4. Australian Gas Association (AGA) Requirement

澳大利亚天然气协会(AGA)要求

The Australian Gas Association regulations require the use of 2 flame detection methods working together to check the flame. The following setups comply with the AGA requirements:

澳大利亚天然气协会的规定要求使用两种火焰检测方法一起工作来检查火焰。以下设置符合 AGA 的要求:

- Mk8 MM: IR **and** UV (option 122 set to 3)
Mk8 控制模块: 红外线 **和** 紫外线 ((选项 122 设置为 3)
- Mini Mk8 MM: IR **and** UV (option 122 set to 5)
Mk8 微型控制模块: 红外线 **和** 紫外线 ((选项 122 设置为 5)
- Mini Mk8 MM: IR **and** Ionisation (option 122 set to 6)
Mk8 微型控制模块: 红外线 **和** 电离 ((选项 122 设置为 6)

The AGA regulations also require that the UV scanner must be self-check type. Standard UV scanners with no self-check function cannot be used.

AGA 规定还要求紫外线检测器必须是自检型。没有自检功能的标准紫外线检测器不能使用。

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