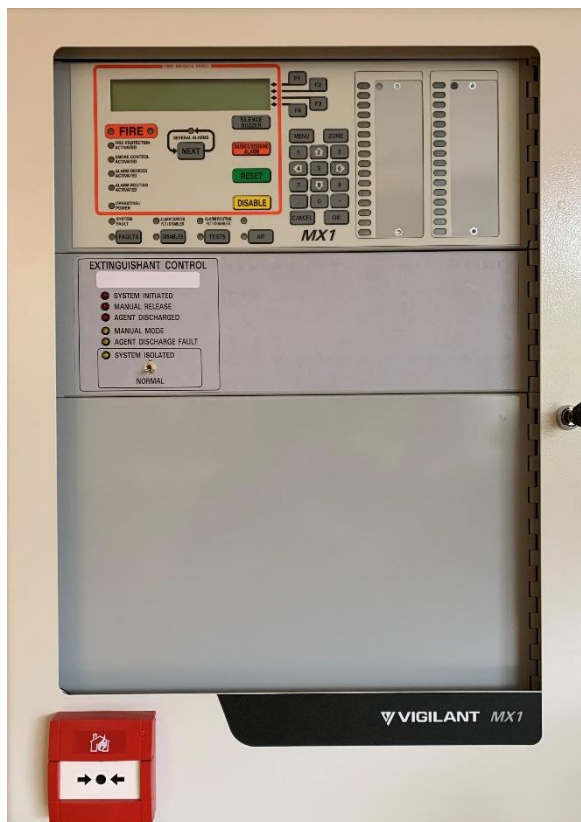


Vigilant *MX1-Au*

FP1164 15U Single Zone
Fire Suppression Controller

Installation and Configuration Guide



LT0719

Issue 1.00

Introduction

The FP1164 MX1-AU Single Zone Fire Suppression Controller solution described in this guide is based on a standard 15U MX1-AU analogue addressable Fire Alarm System.

MX1 programming is simplified using the provided “MX1-AU 1Z Fire Suppression Controller” SmartConfig panel database which is pre-loaded on the FP1164. Instructions later in the guide show how to modify the standard configuration for your requirements.

A copy of this SmartConfig panel database (SF0553) can be downloaded from the Johnson Controls ANZ website or obtained directly from a Johnson Controls Sales or Technical Services Representative.

The VIGILANT MX1 is an innovative, networkable multiple loop analogue addressable fire indicator panel incorporating the latest technology. It complies with AS 7240.2:2004, AS 7240.4:2004, AS 4428.3:2010 and the functional requirements of AS 4428.10:1998 and AS 4428.7:1999.

Its support for MX TECHNOLOGY fuzzy-logic detection algorithms and powerful control functions make it suitable for a wide range of fire protection applications, including those in hazardous areas.

The MX1 Fire Suppression Controller solution may also be connected on a Vigilant Panel-Link, I-Hub Ring or IP network, with the Fire Suppression Controller passing information to the main Fire Indicator Panel (FIP) for indication, brigade routing and activation of the building evacuation system.

The MX1 Fire Suppression Controller has been designed to comply with the Special Hazard Control and Indicating Equipment (SHCIE) requirements of AS 4214:2018 and Special Hazards System requirements of AS1670.5:2018, *but has not been independently assessed to those standards.*

Due to the variety of gas flood / fire suppression systems, and their complexity, not all issues you are likely to encounter will be included or comprehensively addressed in this guide. Assistance should be sought from experts in special hazard protection as required.

Accessory items you will need to purchase to provide the basic solution including:

- MX detectors
- VESDA™ detection (optional)
- Addressable Local Control Station(s) (LCS)
- Required Audio-Visual Indicator (AVI) signs.

Refer to the “Ordering Details” for a full list of included parts and the Accessory items.

Vigilant MX1 Approvals

Vigilant MX1 is certified to:

AS 7240.2:2004: “Fire detection and alarm systems”,

AS 7240.4:2004: “Fire detection and alarm systems”,

AS 4428.3:2010: “Fire detection, warning, control and intercom systems - Control and indicating equipment - Fire brigade panel”

AS 4428.10:1998: “Fire detection, warning, Control and intercom systems - Alarm investigation”

ActivFire Listing Number afp-2320

Ordering Details

FP1164 MX1-AU Single Zone Fire Suppression Controller which includes the following parts:

- 1 x Installation Guide (this document)
- End of line resistors fitted.
Agent Released input [GP IN2] – 2K7 at Terminal
Solenoid Release +/- [QMO O1] – 27K at Terminal
EXT SYS INOP [QMO O2] – 27K at Terminal
Stage 1/2 Select [QMO O3] – 27K on PA0730
Stage 1/2 Power [QMO O4] – 27K at Terminal
- 1 x 6A1 (6A 100V) diode for Actuator EOL supplied in carton.

and the manuals and parts provided with the base MX1 panel.



FP1167 Addressable Local Control Station (LCS)

The FP1164 default configuration supports one FP1167 Addressable Local Control Station (LCS), using the default addresses (11, 12 & 13). The Transparent hinged cover for KAC MCP (SU0272) is used to prevent accidental actuation. If multiple LCS are required, then the addressable modules on subsequent units must be reprogrammed to match the addresses used in the panel database.

FP0853 AVI Sign Red (No Faceplate)

– minimum of 2 required
(IP65 version is FP1037)

FP0854 AVI Sign Yellow (No Faceplate)

– minimum of 1 required
(IP65 version is FP1038)

FA2700 AVI Faceplate

“Fire Alarm – Evacuate Area”
(used with FP0853 Red Sign)

FA2701 AVI Faceplate

“Fire Alarm - Do Not Enter”
(used with FP0853 Red Sign)

FA2776 AVI Faceplate

“Extinguishing System Inoperative”
(used with FP0854 Yellow Sign)



Local Gas Control Station (shown left) IP65 AVI (centre) AVI Mk2 (right)



Detectors 850P/814P, 850PH/814PH, VESDA, as required.

For VESDA, use an MIO800 to connect to the VESDA device's clean contact alarm output(s).

If using the VLC800MX this should be used for one Stage only as smoke threshold differences between Fire and Major Fire are not great enough to be suitable.

MIM800 Mini Input Module – as required for optional cylinder pressure switches and Lock-off valve.

CIM800 Contact Input module – use instead of MIM800 where the length of input wiring from pressure switches, etc. will be greater than 1 metre.

Fire Suppression System AVI Signs

At least two red 2-stage AVI signs are required. If there is more than one entrance to the protected area, multiple sets of AVI signs may be required.

At least one red AVI sign installed **inside** the protected area showing “Fire Alarm” on the top line and “Evacuate Area” on the bottom line.

At least one red AVI sign installed **outside** the protected area with “Fire Alarm” on the top line and “Do Not Enter” on the bottom line.

Both red AVI signs are wired back to the controller on the same cable pair, terminating at the “Stage 1+/2+” terminals in the control panel.

A least one yellow AVI sign “Extinguishing System Inoperative” is also required to indicate when the system is off-line for service or has a fault which will impair its function.

This sign is usually mounted next to the “Fire Alarm” “Do Not Enter” sign installed **outside** the protected area. The speaker in this AVI sign is not used so should be disconnected.

The yellow AVI sign is wired back to the controller terminating at the “EXTINGUISH SYS INOP+” and “0V” terminals in the control panel.

Operation of the Extinguishing System

Stage 1 operation occurs when:

- Any one detection point alarm on **either** of the two detection zones
- Activation of the AGENT RELEASE switch at an LCS (also activates Stage 2 operation)
- Activation of the manifold pressure switch (also activates Stage 2 signs and tones)

The standard configuration will do the following at Stage 1 operation:

- Operation of Building Evacuation
- Illuminate top line “Fire Alarm” on all red AVI signs
- Alert Tones on red AVI signs
- Alarm Routing (if connected).
- any programmed Stage 1 plant shutdown outputs

Stage 2 operation occurs when:

- Detection of a point alarm in **both** detection zones.
- Activation of the AGENT RELEASE switch at an LCS (also activates Stage 1 operation)

The standard configuration will do the following at Stage 2 operation:

- **Extinguishant Release Delay timer starts** (30 seconds by default)
- Illuminate bottom line on all red AVI signs (“Evacuate Area” or “Do not Enter”)
- Evacuate Tones on red AVI Signs

Activation of the manifold pressure switch will activate Stage 1 operation, but only operates the Stage 2 signs and tones. The manifold pressure switch will not start the Extinguishant Delay Timer.

The Extinguishant Release Delay Timer stops running and resets to 0 seconds when:

- **MANUAL MODE** is activated at the LCS

When the Extinguishant Release Delay Timer expires

- Solenoid Output will switch +24V on to the Solenoid +/- terminals for a programmable period (10 seconds by default). *This is the **Actuator Timer**.*
Once the Actuator Timer starts, it will run for its full period.

Local Control Station Operation

Manual Mode stops the automatic operation of the MX1 Fire Suppression Controller by operating the “Manual Mode” switch at the LCS.

Manual Mode will STOP and RESET the Extinguishant Release Delay timer if it has been triggered by the detection zones.

Switching out of Manual Mode while the MX1 Fire Suppression system still has alarms on both detection zones will cause the Extinguishant Release Delay Timer to restart, with Extinguishant Release following completion of the delay.

Note: If the Extinguishant Delay Time and Actuator Timer have expired while the System Isolate Switch has been operated, or the actuators are otherwise isolated, switching the LCS in and out of Manual Mode while the detection zones are still in alarm will RESET and RESTART the Extinguishant Release Delay, and allow the Actuator to operate when the delays expire.

Manual Release MCP operation on the LCS provides a simultaneous Stage 1 & Stage 2 alarm.

This will cause immediate start of the Extinguishant Release time delay, with Extinguishant Release following completion of the delay.

Manual Mode will NOT STOP and RESET the Extinguishant Release Delay timer if it has been triggered by the Manual Release MCP.

Once the Manual Release MCP has been operated release of the extinguishant can only be stopped by operating the System Isolate switch at the SHCIE, or physically disabling the actuator at the cylinders.

System Isolate Control at the MX1 Fire Suppression Controller

System Isolate is a physical isolation on the Solenoid Output only.

Operating the System Isolate switch will not STOP or RESET the Extinguishant Release Delay Timer or the Actuator Timeout. The timers will continue to run as normal (unlike Manual Mode, see above)

*Switching the System Isolate switch back to Normal **after** Extinguishant Release Delay Timer or the Actuator Timeout have both expired will have no effect. Extinguishant will not be released.*

*Switching the System Isolate switch back to Normal **before** the timers have expired will cause the system to operate as normal. Extinguishant will be released.*

Once the Extinguishant Release Delay Timer or the Actuator Timer have expired, Manual Release from the LCS will not reactivate the timers.

Manifold Pressure Switch

After Extinguishant Release the Pressure Switch on the manifold should have operated and will be confirmed by illumination of the “AGENT RELEASE” LED on the MX1 Fire Suppression Controller.

If the Extinguishant has released at the cylinders by the mechanical releasing device, the Pressure Switch Operated input will cause full Stage 1 operation and turn on the signs and tones for Stage 2.

Mechanical release of the extinguishant will not cause the electronic actuator to operate.

Extinguishing System Inoperative

If the MX1 Fire Suppression Controller system is off-line for service (System Isolate), in Manual Mode, or has a fault which may impair its function, according to AS1670.5:2018, the system must operate the Extinguishing System Inoperative sign(s). These signs are normally be positioned at the entrance to the protected area, adjacent to the “Fire Alarm / Do Not Enter” sign.

However, if the user’s preference is to only operate the Extinguishing System Inoperative sign for Detection Zone Disables, Manual Mode Switch (at LCS) and System Isolate (at SHCIE), then set “\$EXTRA_FAULTS_CAUSE_ESI_A1” to FALSE. (Default is TRUE).

Configuration

The FP1164 MX1-AU Fire Suppression Controller default configuration has been created in SmartConfig V2.9.0.0 and provides the gas flood logic, as well as the standard fire alarm functions.

The Template's Instructions page provides comprehensive instructions on configuring the Template and details of which MX1 resources are used.

Configuring an MX1 Fire Suppression Controller from the Template:

- Add the detection points and mapping them as appropriate to zones 1 and 2
- Enter Point and Zone names
- Check timing and operational defaults
- Configure any extra Stage1 and Stage 2 ancillary outputs.

The fire detection can be point detectors, VESDA, or a combination of these.

The standard template configuration uses the FP1167 LCS to provide the AGENT RELEASE and MANUAL MODE switches along with a SYSTEM ISOLATE/MANUAL MODE.

The template is set up to use 1 x FP1167 at the default addresses (11, 12 and 13)

If multiple LCS units are used, the default addresses will need to be changed in subsequent LCS units, and these points added to the system configuration in SmartConfig.

Additional Points to be added (copied from default addresses 11, 12 and 13) as follows:

- Manual Release MCP points added to Zone 3
- Manual Mode Switch points added to Zone 5

Note: with multiple LCS, Manual Release at one station will override Manual Mode at another.

The Visual Warning Devices control outputs are designed for Vigilant AVIs.

Automatic switching of AVIs is described in the section above.

The QMO drives the Solenoid Output and AVI Signs, supplied through the External Power terminals from the ANC1 (VBF1) on the MX1 Controller.

Ensure the combination of the Solenoid Current and the Power required to drive the AVI Signs does not exceed the rating of the fuse.

The user can change the Extinguishant Release Delay Timer and how long power is be applied to the Actuator at discharge (Actuator Timer). The defaults are 30 seconds and 10 seconds respectively, but these can be changed on the Output Logic Page in the Configuration.

The MCP on the MX1 door is mapped to Zone 11 and Alarm Devices Group 1. The network profile suggested for the Fire Suppression Controller prevents alarm list messages being sent on the network. **If a Brigade Alarm is required for the MCP, it will need to be programmed accordingly.**

The shutdown of Air-Conditioning and other services may be controlled by separate Ancillary Control Zones which can be separately disabled and separately identified on the MX1 Fire Suppression Controller's LCD to make separate testing of these functions easier. Zones 12 to 16 are available for these functions in the MX1 Fire Suppression Controller panel database.

As per AS4214, if a Lock-off valve is required to allow a person to enter the protected area, it must operate the Extinguishing System Inoperative signs.

By default, no points are mapped for a Lock-off valve. When a Lock-off valve is required, add these points and map them to Zone 7. The End of Line Resistor required will depend on the MX module selected. Please refer to the instructions provided with the module.

Networking the MX1 Fire Suppression Controller

For networked connection of an MX1 Fire Suppression Controller to the Main Building FIP use the preprogrammed Network Variables to send the Building Evacuation signal and the Gas Released signal. Supervision of the connection is built into the network operation.

The MX1 Fire Suppression Controller's local Network Profile must be set to "Network Independent Gas Panel". This ensures the suppression system is not (directly) controllable by other panels, that the AVIs operate independently from the main building evacuation systems, that the status of the MX1 Fire Suppression Controller is sent (via network variables) and prevents the alarm list messages being sent onto the network.

The MX1 Fire Suppression Controller should have the Main Building FIP programmed into its SID Points table, using the SID Config Profile "Monitored Panel" so that the MX1 Fire Suppression Controller indicates a fault if the network connection fails, or the Main Building FIP itself fails.

The Main Building FIP should have the MX1 Fire Suppression Controller programmed into its SID Points table, using a SID Config Profile that simply monitors the MX1 Suppression Controller. This also allows its network variables to be accessed. If the Main Building FIP is MX1, and does not have a suitable SID Config profile, copy the "Monitored Panel" profile from the Suppression template.

The MX1 Fire Suppression Controller sets and sends network variables as follows:

```
; Standard Network Variables
NV1 = $ALARM_STAGE1_A1
NV2 = $ALARM_STAGE2_A1
NV3 = $$SYSTEM_INITIATED_A1
NV4 = $AGENT_DISCHARGED_A1
NV5 = $$SYSTEM_ISOLATE_A1
NV6 = $MANUAL_MODE_A1
NV7 = $EXTINGUISHING_SYSTEM_INOP_A1
NV8 = $AGENT_DISCHARGE_FAULT_A1
```

An MX1 Main Building FIP can use the network variables in an output logic equation to drive a LED to indicate the status of the fire suppression system.

For example, LEDMy = NVx/1 AND Z_LED_ALM.

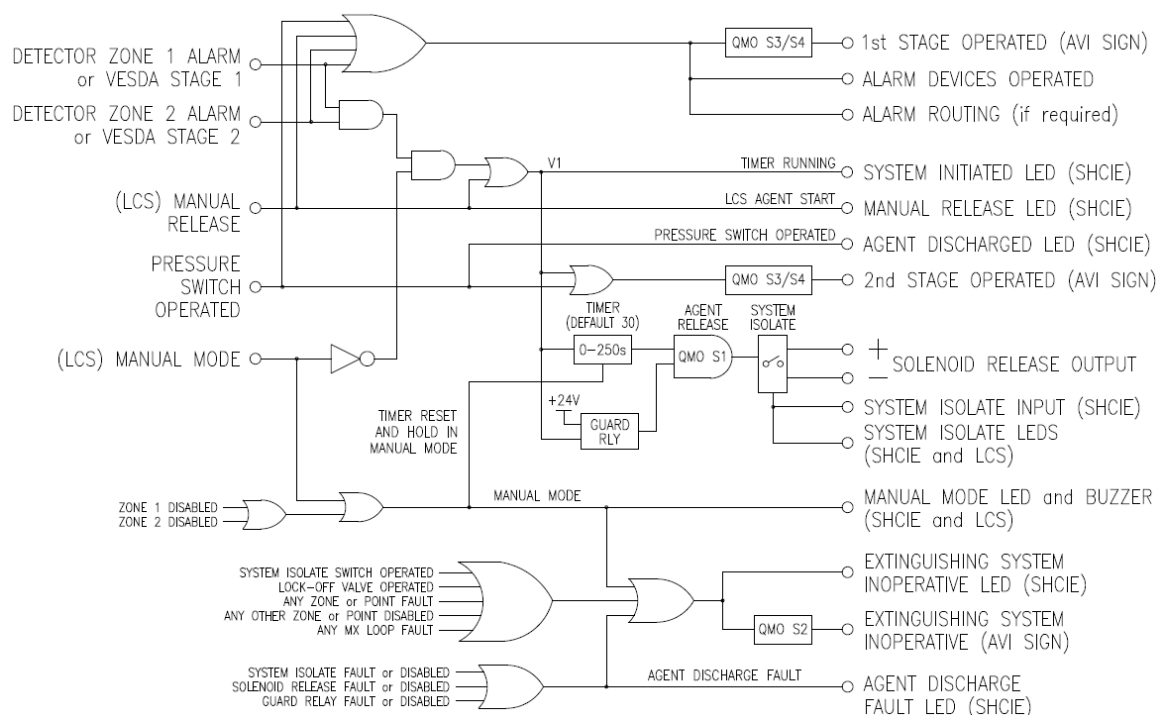
An MX1 Main building FIP can use a network variable to drive the building occupant warning system by driving the alarm state of a pseudo point through output logic, e.g., PPy/0AL=NVx/2.

The pseudo point can be appropriately named, and its alarm type text can be set to "Suppression".

The pseudo point is then mapped to a suitably programmed Sprinkler FBA/DBA zone, for indication (LED and alarm list) and activation of the building occupant warning system.

Additional network variables can be added as required to allow other outputs from this MX1 Fire Suppression Controller to interact with building services through other FIP panels on the Network.

MX1 Fire Suppression Controller Logic Diagram



MX1 Fire Suppression Controller Logic Diagram

Zone 1 = Zone 1 Detection Points

Zone 2 = Zone 2 Detection Points

Zone 3 = AGENT RELEASE MCP from Local Control Station

Zone 4 = AGENT RELEASED Input from Manifold Pressure Switch

Zone 5 = MANUAL MODE Switch from Local Control Station

Zone 6 = SYSTEM ISOLATED Switch from SHCIE front panel

Zone 7 = Lock-off Valve (if fitted)

MX1 Keyboard Open Collector Outputs drive the following LEDs

- SYSTEM INITIATED LED - i.e. Extinguishant Release Delay Timer Running)
- MANUAL RELEASE LED (i.e. LCS AGENT RELEASE MCP)
- AGENT DISCHARGED LED (i.e. Manifold Pressure Switch operated)
- MANUAL MODE (i.e. MANUAL MODE Switch operated at Local Control Station)
- AGENT DISCHARGE FAULT LED (i.e. Any fault that may affect the operation of the system)

SYSTEM ISOLATED LED is driven directly from the System Isolate Switch

ANC1 Relay = Guard Relay

QMO Relay 1 = Solenoid Output

QMO Relay 2 = System Inoperative AVI sign

QMO Relay 3 = Select Stage 1 or Stage 2 Operation for Red AVI Signs

QMO Relay 4 = Power for Red AVI Signs

Extinguishant Release Delay Timer default = 30 seconds

Actuator Timer default = 10 seconds

AVI Mk2 Wiring

AVI Mk2s have pairs of terminals that provide connection to the FIP and allow easy “daisy chaining” of multiple AVIs.

A “SYNC” output allows for synchronisation of tone and LED flashing on daisy chained AVIs.

For Stage 1 and Stage 2 operation:

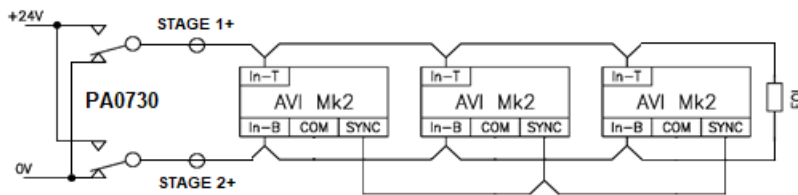
A 2-wire connection from the FIP to the first AVI.

A 3rd wire is required from the first AVI sign to subsequent signs if they are to be synchronised.

When IN-T is positive and IN-B is negative, the top LEDs flash, the default tone is Alert.

When IN-B is positive and IN-T is negative, the both LEDs flash, the default tone is Evac.

End of Line Resistor is 27K

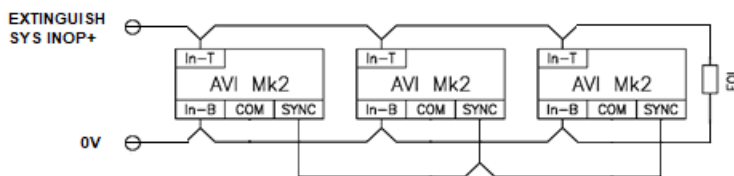


For Extinguishing System Inoperative:

A 2-wire connection from the FIP to the first AVI Sign.

No Sync wire is required as there is no tone required for these signs.

End of Line Resistor is 27K



Load Calculations for the Suppression Zone

The MX1 Zone Fire Suppression Controller supports a Single Zone and uses VBF1 to supply power for that Zone.

The VBF1 Fuse (F3) is the top fuse on the MX1 Controller board, adjacent to the ANC1 terminals.

The Fuse is a 20x5mm 3A (Slow Blow).

Calculate the Total maximum current for the Protected Area, including the actuators (see below) and the required warning signs.

Each set of AVI signs (2 x Red Fire Alarm and 1 x Yellow Extinguishing System Inoperative) draws approx. 200mA with all signs on.

The Detectors and other MX devices (like the addressable LCS) need to be considered in the MX Loop Calculations.

Actuators

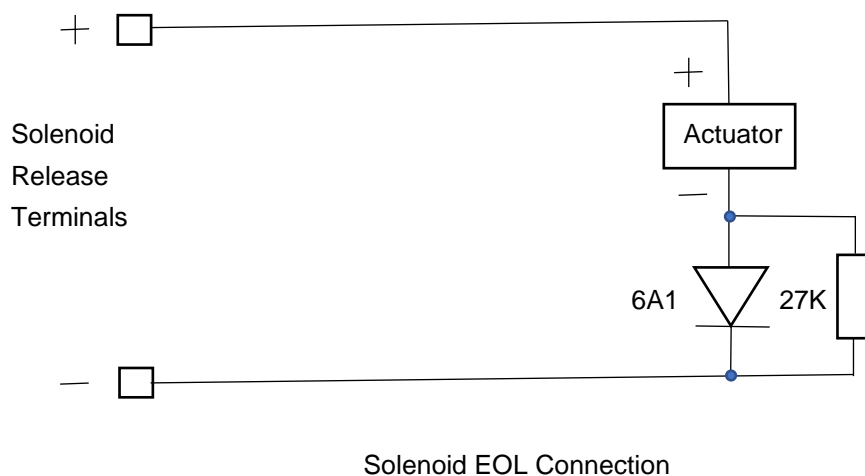
Actuators are to be installed to the Manufacturers Specifications, within the following limits:

The Solenoid Output Relay is Rated at 30Vd.c. 1A inductive, 2A resistive.

We do not recommend connecting solenoids in parallel on one circuit as the supervision will not detect one being disconnected.

Voltage at the Solenoid Release Terminals can vary between Battery Low (24.2V) and Charger High (28.2V).

The Solenoid Release Output is monitored by the QMO, using EOL value of 27K.



Wiring Diagram

The wiring diagram for the MX1 Fire Suppression Controller is shown on the next page.

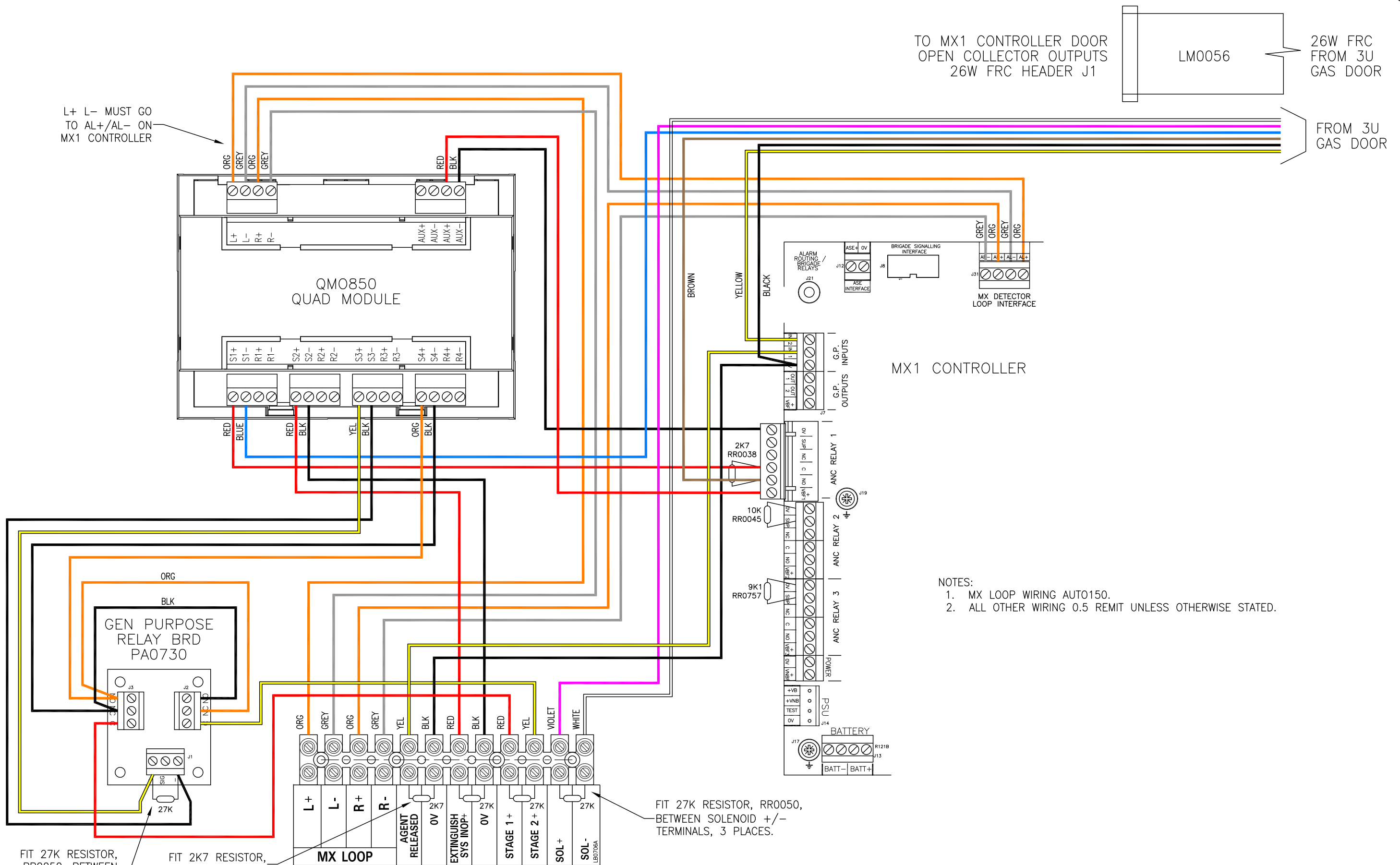
Wiring of 3U Door and System Isolate Switch:

The LEDs for the Extinguishant Control on the 3U Door are driven from Open Collector Outputs (J1) on the MX1 Keyboard and connected to the termination board by a 26W Flat Ribbon Cable (LM0056).

1st and 2nd poles of the System Isolate switch isolate both sides of the Solenoid Release Output.

System Isolated LED is switched directly to 0V from the Solenoid Release Output.

System Isolate (3rd Pole of the System Isolate Switch) is monitored by GPIIn1 on the MX1 Main Bd.



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UNLESS OTHERWISE STATED:

ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE. TOLERANCES ARE TO BE: 1 DECIMAL PLACE ±0.5, 2 DECIMAL PLACES ±0.3, 3 DECIMAL PLACES ±0.1

3rd ANGLE PROJECTION

ISS/REV	AMENDMENTS	ECO	DRN	CHKD	AUTH	APVD	DATE
A	ORIGINAL	5286	KJS	TH	MH	DC	28-1-20
B	ANC RELAY 3 RR0757 WAS RR0045, MX1 GP OUTPUTS CONNECTION SWITCHED.	5345	KJS	TH	MH	DC	29-7-20

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MX1 AUST 15U PANEL
WITH 3U GAS DOOR
WIRING DETAILS

DRAWING No: 1982-227 SHEET 2 of 3

A2 ISS/REV B PART No: FP1164

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