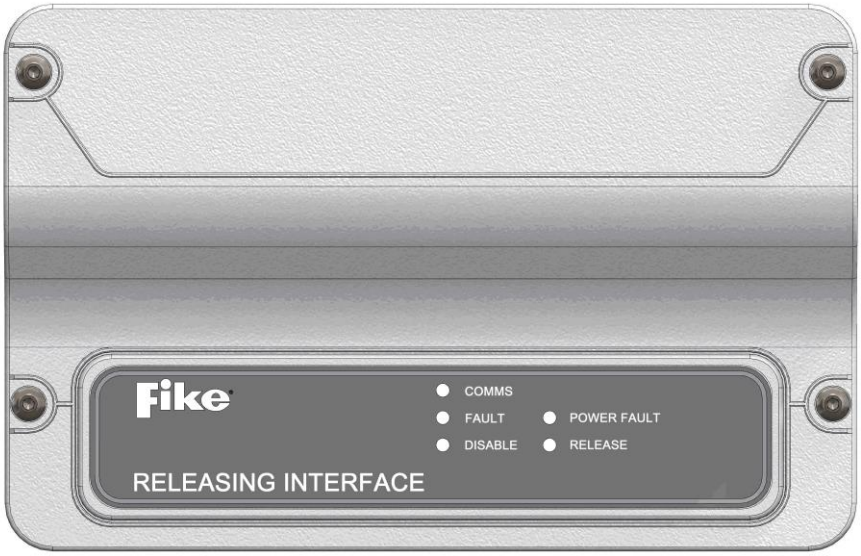
# TWINFLEX® SRM




## Solenoid Releasing Module
## 100-0010

**(Suitable for TWINFLEX® SRP control panels from V01.000)**

# Solenoid Releasing Module Engineering and Commissioning Manual

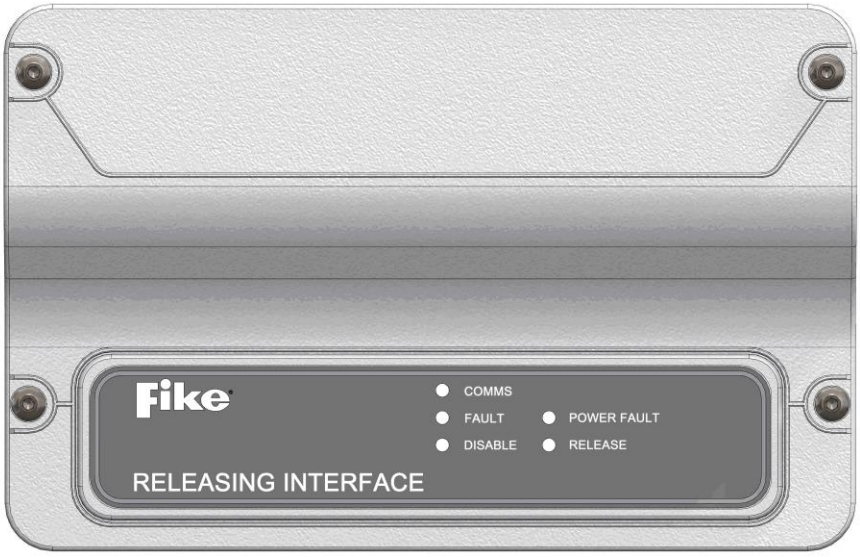
**(TO BE RETAINED BY THE COMMISSIONING ENGINEER)**

## Contents

## General Description

The SRM (Solenoid Releasing Module) is a module that controls the operation of the Solenoid valve(s) in a Suppression system. The typical applications where the SRM can be implemented for are – Pre-action sprinkler, Deluge, CO2, Water mist and Foam. The SRM can be used to monitor a Discharge Pressure switch to provide feedback to the Control Panel that the Releasing agent has been dumped into the protected space. The SRM can also be used to monitor the Solenoid and container for any fault conditions like low bottle pressure, wire connections, faulty actuator coil, tamper valve etc.

The SRM is connected to the Twinflex SRP (Single Releasing Panel) via a dedicated zone circuit.
The zone circuit is configured on the SRP as – Release SRM. A maximum of 2 SRMs can be connected on a Zone circuit. The communication between the SRP and SRM(s) is established via the Twinflex signaling protocol.



# Before Installation

The Twinflex SRM must be installed in compliance with the SRP installation manual. The installation must also meet the requirements of any local authority and BS7273 Pt1 : 2006.

## Positioning

The module should be mounted securely and care should be taken to ensure the device is accessible for future maintenance.

## Device Installation / Mounting

All wiring must be installed in compliance with the recommendations laid out by BS7273 Pt1 : 2006 as well as any special recommendations documented in the control panel installation manual. The cabling used should be of a 2-core 1.5mm$^2$ screened, fire resistant type (e.g. MICC or FP200 equivalent), and is to be wired in the form of a screened 2-core radial circuit (with no spurs) from the control panel, terminating at the last ("End of Line") device. Note that ALL connections, including inputs, should be made via screened FP cable.

Fix the back box in a suitable position using the screw holes provided on the back, remembering to allow enough space for the correct termination of the appropriate fire resistant cable. See technical data on page 15 for enclosure dimensions.

This equipment is only IP30 rated so must be mounted outside the area being protected.

There are six 20mm cable entry points provided on the top and one on each side of the enclosure. These are not knockouts and should be removed either by running a sharp knife around their outer groove or drilling out the cable entry points.
Site safety procedures should always be observed when using a knife to remove the cable entry points. If cable entry points are drilled out the PCB should be removed from the enclosure before drilling (see Figure 1).

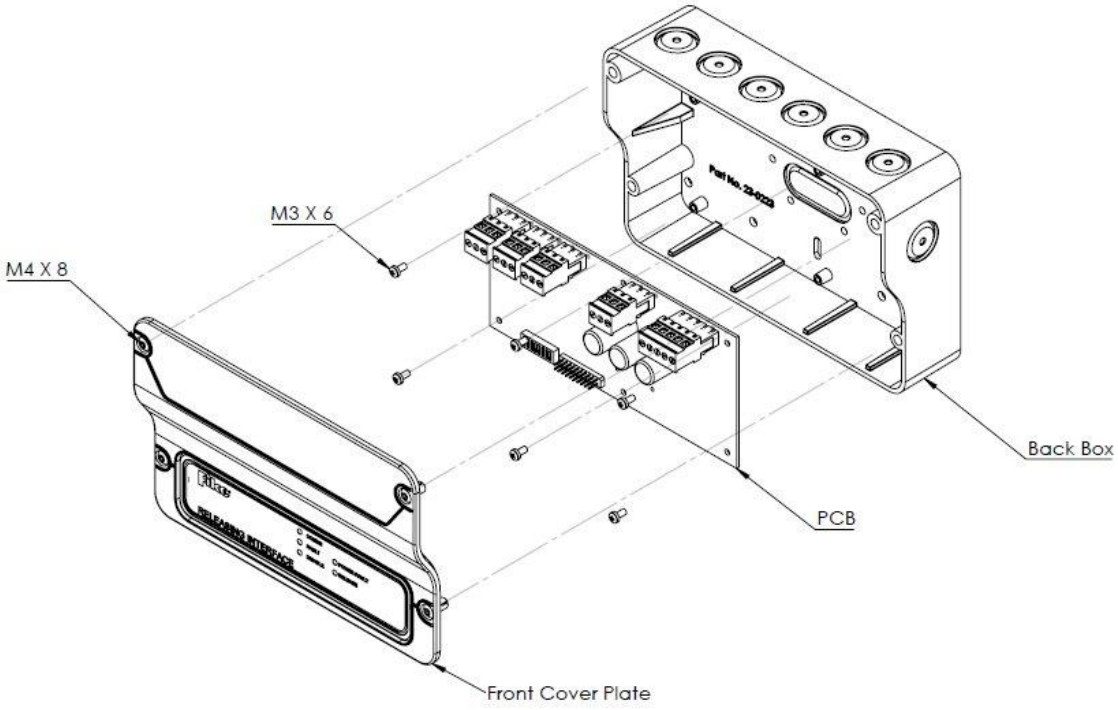



**Figure 1 – The SRM Layout**

Stuffing glands should be used on all cables to prevent stress being applied to the PCB mounted terminals.

Care should be taken when terminating devices to ensure all cables are correctly sleeved and connections are secure. Improper connections will prevent a system from responding correctly in the event of a fire.

To prevent an inadvertent extinguishant discharge, the solenoid valve should not be connected to the container while wiring the SRM circuits and setting up the DIL switches SW1 and SW2. The solenoid should be connected to the container after all other installation has been completed and verified.

# Connections

In order to carry out high voltage testing and resistance measurements, temporarily connect the incoming and outgoing zone cables to each other using a 3-way connector block. Once all testing has been carried out on the cabling, and 'continuity & integrity' has been proven, the SRM may be connected and assembled.

Please remember that all high voltage testing must be carried out before the installation of the SRM otherwise the electronics will be damaged.

***Remember that the device at the end of the line must have its EOL signal activated using the relevant EOL switch (Refer to DIL switch settings table on page 12). Do not use a resistor or capacitor (or another manufacturer's End of Line device) as the end of line, as this may prevent correct operation of the zone.***

## Module Layout

The following figure shows the SRM layout. Terminals J1 thru J6 are used for all the field wiring connections. DIL switch SW1 is used to select between 1x24V or 2x12V solenoid(s) and DIL switch SW2 is used to configure the SRM (Refer to DIL switch SW2 settings table on page 12).

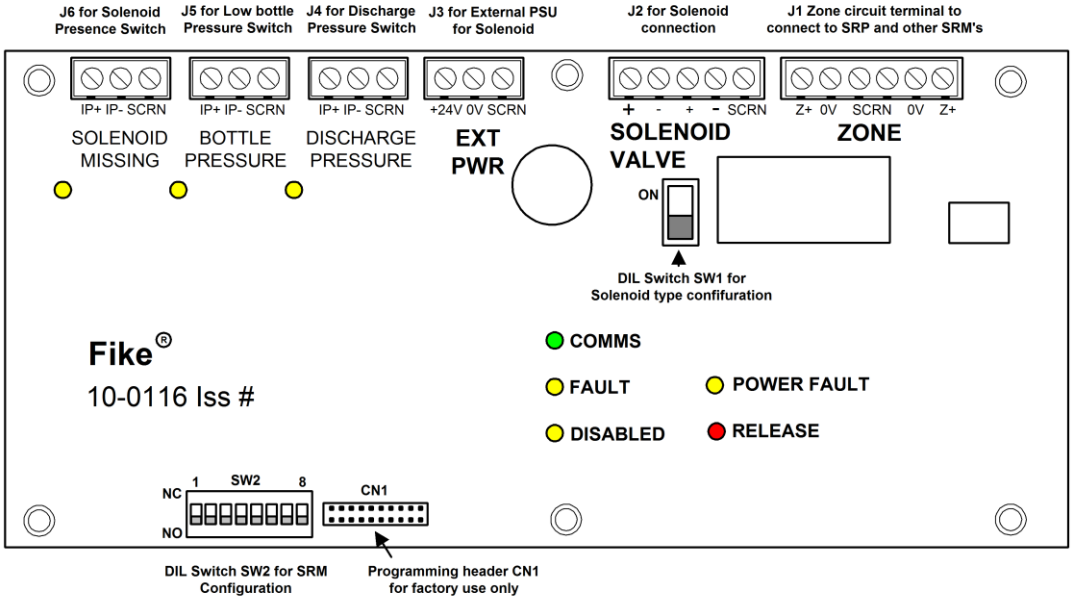



**Figure 2 – SRM Board Layout**

## Zone Connections (J1)

Figure 3 shows how to make the zone positive, zone negative and screen connections between the SRP panel and the SRM(s).

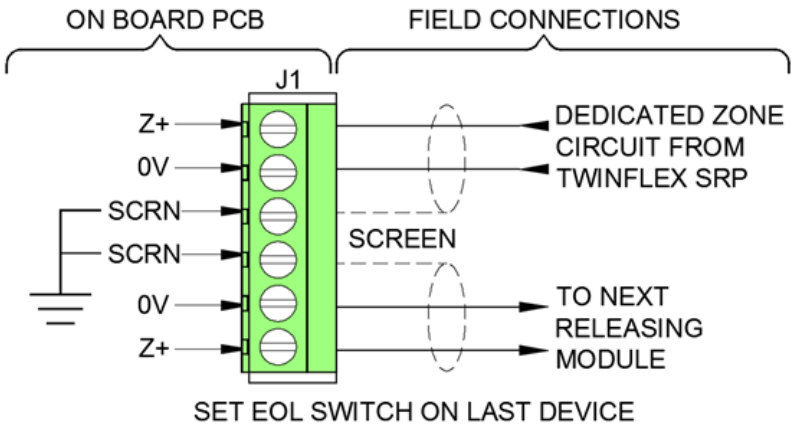



**Figure 3 – Zone Connections**

Please note that the “SCREEN” terminals on the SRM should only be connected to the zone cable screen and NOT to the building earth or the back box earth terminal. The cable screen is connected to earth at the panel end only, via the zone “SCRN” terminal. It is important to maintain the screen continuity in order to protect against data corruption from interference.

Fault Monitoring – Zone connections are power limited and supervised. Open and Short faults cause a loss of communication between the SRP panel and the SRMs. They are detected and annunciated by the SRP panel.

## Solenoid Connections (J2)

Solenoid connections are power limited and supervised. The Solenoid connection (12 or 24 volt) requires an EOL circuit supervision assembly (Part# 17-0144), provided by Fike, to be installed between the SRM and the solenoid coil. The assembly provides a means to monitor the solenoid wiring for open and short faults.

A single 24V solenoid must be connected as shown in Figure 4. DIL switch SW1 must be in **ON** position and the solenoid needs to be connected between terminals 1 and 4 at the Solenoid Valve terminal block. The maximum cable length between the Solenoid and the SRM must not exceed 3 meters.

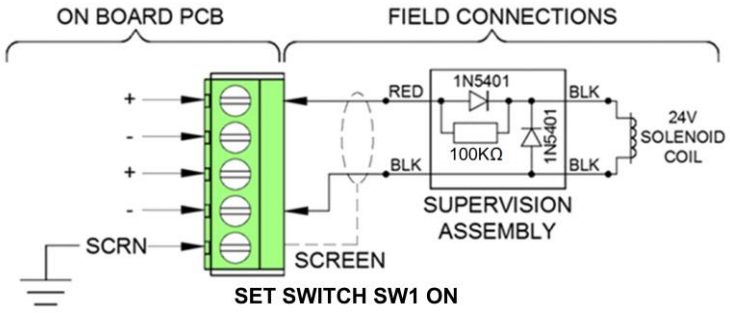



**Figure 4 – 24 Volt Solenoid Connections**

Two 12 V solenoids must be connected as shown in Figure 5.
DIL switch SW1 must be in **OFF** position. Solenoid #1 needs to be connected between terminals 1 and 2 and Solenoid #2 needs to be connected between terminals 3 and 4 at the Solenoid Valve terminal block on the SRM. The maximum cable length between the solenoid and the SRM must not exceed 3 meters.

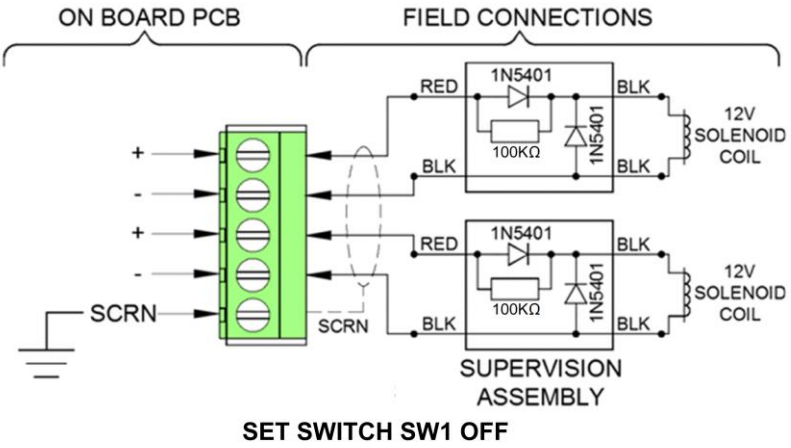



**Figure 5 – 12 Volt Solenoid Connections**

## External Power for Solenoid (J3)

A 24V DC 2A External Battery Backed Up power supply is required to power the solenoid to dump the Releasing agent. The 24V DC power can be supplied by the SRP panel AUX PWR 1 & AUX PWR 2 terminals.

**Note: If the SRP Panel AUX PWR is used, each AUX PWR output can supply up to a maximum of 1A which must not be exceeded.**

If a separate external power supply is used it must be listed for use with Fire Alarm systems. It must be connected to +24V and 0V terminals on J3.

Due to 24V DC input and solenoid isolation from the host control panel the connected power supply must have the ability to indicate a ground fault on the 24V DC and also provide an on-board fault relay that must be connected to a Monitored Input on the SRP to signal the fault.

## Input Connections (J4, J5, J6)

Input connections on Terminals J4, J5 and J6 are all contact closure inputs. The inputs can be individually configured (via DIL switch SW2) to be normally open or normally closed. Figures 6 and 7 show how to make input connections. All input connections are power limited and supervised.
The maximum cable length between the input device and the SRM must not exceed 3 metres.

Note: The triggering resistor used can be a 470Ω resistor (shown) or a 680Ω resistor.

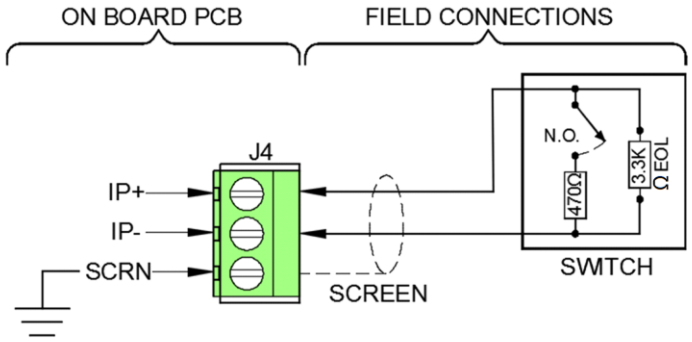



**Figure 6 – Normally Open Input Connection**

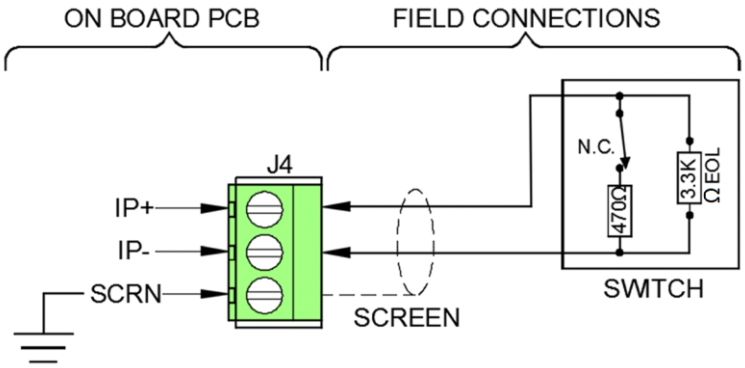



**Figure 7 – Normally Closed Input Connection**

## Discharge pressure circuit (J4)

The following table shows state of the circuit based on connection type and switch position:

| | **Switch Open** | **Switch Closed** |
|---|---|---|
| **Normally Open** | Normal state | Active state |
| **Normally Closed** | Active state | Normal state |

Normal state - Circuit is in Normal state.

Active state – The Discharge pressure switch is active which indicates that the extinguishing agent has been released. The SRP Panel indicates this as a Released condition.

## Bottle pressure switch circuit (J5)

The following table shows state of the circuit based on connection type and switch position:

| | **Switch Open** | **Switch Closed** |
|---|---|---|
| **Normally Open** | Normal state | Active state |
| **Normally Closed** | Active state | Normal state |

Normal state - Circuit is in Normal state.

Active state – Bottle pressure switch is active which indicates that the pressurized container has a leak. The SRP panel indicates this as a Fault condition.

## Solenoid Missing circuit (J6)

The following table shows state of the circuit based on connection type and switch position:

| | **Switch Open** | **Switch Closed** |
|---|---|---|
| **Normally Open** | Normal state | Active state |
| **Normally Closed** | Active state | Normal state |

Normal state - Circuit is in Normal state.

Active state – It indicates that the solenoid has been physically removed from the releasing agent container for maintenance or testing. The SRP panel indicates this as a Fault condition.

# Acceptance Testing

Acceptance testing shall be performed in accordance with the requirements of BS7273 Pt1 : 2006, requirements of the Local Authority Having Jurisdiction (AHJ), and the following requirements:

**Note: before carrying out the following tests the Solenoid must not be connected to the suppression container.**

1. Temporarily disconnect the solenoid valve wires from the SRM and verify that a fault signal is received by the SRP panel.

2. Temporarily switch off the end-of-line switch from the last SRM or disconnect the last SRM and verify that a fault signal is received by the SRP panel.

3. Temporarily remove the end of line (EOL) resistor across the Solenoid Missing Input and verify that a fault signal is received by the SRP panel. Repeat this for Bottle Pressure and Discharge Pressure Inputs. These faults take approximately 60 seconds to be reported.

4. Temporarily trigger the Solenoid Missing Input by connecting a 470Ω or 680Ω resistor across IP+ and IP- terminals and verify that a fault signal is received by the SRP panel. Repeat this for the Bottle Pressure Input. These faults take approximately 60 seconds to be reported.

5. Temporarily trigger the Discharge Pressure Input by connecting a 470Ω or 680Ω resistor across IP+ and IP- terminals and verify that the system goes into a release state.

6. Verify the SRM Release LED illuminates and the solenoid valve operates.

7. Reset the SRP panel and verify that the SRM Release LED turns off.

8. Using either a manual release or the detection method of the panel, initiate the release mode.

9. Verify the SRM Release LED illuminates and the solenoid valve operates.

10. Reset the SRP panel and verify that the SRM Release LED turns off.

11. Verify that the SRM does not activate during any state other than Release for the programmed Zone.

12. Secure the SRM front cover plate to the back box using the screws provided, as shown in Figure 1 above. Make sure wiring is not pinched or excessive strain is not placed on the SRM terminal block.

## Hardware Connections

**STOP WARNING**

**If there are ground faults present on the control system, do NOT connect the Solenoid Valve to the suppression container. Doing so could result in accidental agent discharge.**

After the acceptance tests connect the solenoid valve (Figure 8) according to the valve manufacturer's instructions.

*A Supervision Assembly must be used between the solenoid and the SRM, see Figures 4 & 5.*

*The maximum cable length* between the solenoid and the SRM must not exceed 3 metres.

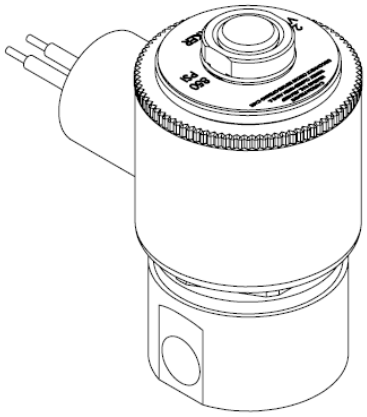


**Figure 8 – Solenoid Valve**

**Note:** A discharge pressure switch (P/N 02-12534) must be installed on the discharge piping for each container equipped with a manual release actuator (required as per EN12094-1 Section 4.18 option with requirements).

## Inspections & Testing

The suppression system(s) shall be inspected and tested in accordance with the requirements of BS7273 Pt1 : 2006 and the Local Authority Having Jurisdiction (AHJ). Inspection and testing shall be performed by the system installer or an approved maintenance company who has been trained on the correct operation and testing of the system. Any defects should be recorded and reported to the person responsible for routine testing.

## DIL Switch SW2 Settings

The SRM can be configured via an on board DIL switch SW2 as per the table below. The **last** device on the zone circuit must have the EOL signal **enabled** (switch number 1 in the 'ON' position).

| Switch position | Configuration |
|---|---|
| 1 | OFF (Default) – Not an EOL device.<br>ON – EOL device. |
| 2 | OFF (Default) – The SRM indicates Released State only when a Discharge pressure switch activates.<br>* ON – The SRM indicates Released State when a Solenoid coil is energized OR a Discharge pressure switch activates.<br><br>**NOTE: Only one SRM per zone circuit shall be set to activate the Discharge Pressure Switch input.** |
| 3 | OFF (Default) – Discharge pressure contact is Normally Open.<br>ON – Discharge pressure contact is Normally Closed. |
| 4 | OFF (Default) – Bottle pressure contact is Normally Open.<br>ON – Bottle pressure contact is Normally Closed. |
| 5 | OFF (Default) – Solenoid presence contact is Normally Open.<br>ON – Solenoid presence contact is Normally Closed. |
| 6 | Always OFF.<br>Unused. |
| 7 | Always OFF.<br>Used for Factory Test mode. |
| 8 | Always OFF.<br>Used for Factory Test mode. |

* This option can be used when a Discharge pressure switch is not installed for Releasing pressure confirmation. In that case the SRM can indicate a Released state as soon as the Solenoid coil is energized.

## LED Table

| LED Label | Pattern | Indication | State |
|---|---|---|---|
| Disabled | Fast Blink | SRM Disabled. | Disabled |
| | Off | SRM Enabled. | Normal |
| Release | Fast Blink | Agent Released. | Released |
| | Off | Agent not Released. | Normal |
| Discharge Pressure | Fast Blink | Discharge pressure is high. | Release in process |
| | Slow Blink | Discharge pressure switch wire short fault. | Fault |
| | Very Slow Blink | Discharge pressure switch wire open fault. | Fault |
| | Off | Discharge pressure is normal and wiring is good. | Normal |
| Bottle Pressure | Fast Blink | Bottle pressure is low. | Fault |
| | Slow Blink | Bottle pressure switch wire short fault. | Fault |
| | Very Slow Blink | Bottle pressure switch wire open fault. | Fault |
| | Off | Bottle pressure is normal and wiring is good. | Normal |
| Solenoid Missing | Fast Blink | Release Tamper input activated | Fault |
| | Slow Blink | Release Tamper input wire short fault. | Fault |
| | Very Slow Blink | Release Tamper input wire open fault. | Fault |
| | Very Slow Double Blink | Solenoid coil open fault. | Fault |
| | On Continuous | Solenoid coil short fault. | Fault |
| | Off | No faults on Solenoid coil and Release Tamper input is in Normal state. | Normal |
| Power Fault | Fast Blink | External power is low. | Fault |
| | Off | External Power is good. | Normal |
| Fault | Fast Blink | A Fault condition is present on the SRM. Check other LEDs to determine the Fault type. | Fault |
| | Off | No Fault present on the SRM. | Normal |
| Comms | Off | The SRM is not functional. | Fault |
| | Momentary Blink every 5 seconds | The SRM is functional and communicating with the SRP panel. | Normal |

Fast Blink – LED blinks once every ¼ second.
Slow Blink – LED Blinks once every 2 seconds.
Very Slow Blink – LED Blinks once every 5 seconds.
Very Slow Double Blink – LED Blinks twice every 5 seconds.

# Operation

**Fault Monitoring** – The SRM monitors all field wiring circuits for open and short faults. A fault is indicated via on-board LEDs at the SRM. Fault type can be determined by observing the blink pattern of active LEDs as listed in the LED table. Fault status is communicated to the SRP panel for indication at the panel.

**Disablement** – The SRM can be disabled by disabling all releasing circuits at the SRP panel. The disablement is indicated via the Disabled LED at the SRM. During disablement, the SRM does not activate the solenoid automatically but it can still be activated manually via manual release actuator. The SRM can be re-enabled by enabling all releasing circuits at the SRP panel.

**Automatic Activation** – The SRP panel signals the SRM to activate whenever the activation condition is established. The SRM utilizes the external 24 volt power for solenoid activation. Based on the DIL switch SW2 configuration setting, either the SRM waits for confirmation from the Discharge pressure switch or it indicates a Released state as soon as the solenoid coil is energized.

**Manual Activation** – Manual activation is done by triggering the manual release actuator. A Discharge pressure switch is required to indicate a Released state after a manual activation.

# Technical Data

| | | |
|---|---|---|
| Dimensions: | Overall Weight…… | 364g |
| | Overall Size (W x H x D)…… | 189mm x 120mm x 56mm |
| Operating Temperature: | …… | -5°C to 40°C |
| Voltage Ranges: | Ext Supply…… | 24V to 28.5V DC |
| | Zone Voltage…… | 21.1V to 32V DC |
| Zone Operating Current (Typical): | Quiescent…… | 2.29mA |
| | End of line ON (if applicable)…… (*in addition to Quiescent current*) | 0.07mA |
| | Active…… | 5.58mA |
| Device Loading Units (DLUs) | …… | 80 |
| Number of devices per zone | …… | 2 |
| Solenoid: | …… | 12V or 24V (see Solenoid Connections on p6) |
| External Power Supply: (*for Solenoid*) | …… | 24V to 28.5V, 2A Max. |
| Max Cable Length to Inputs: | …… | 3 Metres |
| Max Cable Length to Solenoid | …… | 3 Metres |
| Flammability: | …… | UL94-V2 |
| IP Rating: | …… | IP 30 |
| Part Code: | …… | 100-0010 |

## Technical Support

**Contact your supplier for technical support on this product.**

Due to the complexity and inherent importance of a life risk type system, training on this equipment is essential, and commissioning should only be carried out by competent persons. Fike cannot guarantee the operation of any equipment unless all documented instructions are complied with, without variation. This unit complies with the EMC directive.

Fike's policy is one of continual improvement and the right to change a specification at any time without notice is reserved. Whilst every care has been taken to ensure that the contents of this document are correct at time of publication, Fike shall be under no liability whatsoever in respect of such contents. E&OE.

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**15**
**DoP-100-0010**
0843-CPR- 0222

**Input/Output Device per EN54-18 ZA.3.**
**EN54-18:2005**
**100-0010**
**Intended for use in the fire detection and fire alarm - Fixed fire fighting and gas extinguishing systems in and around buildings**