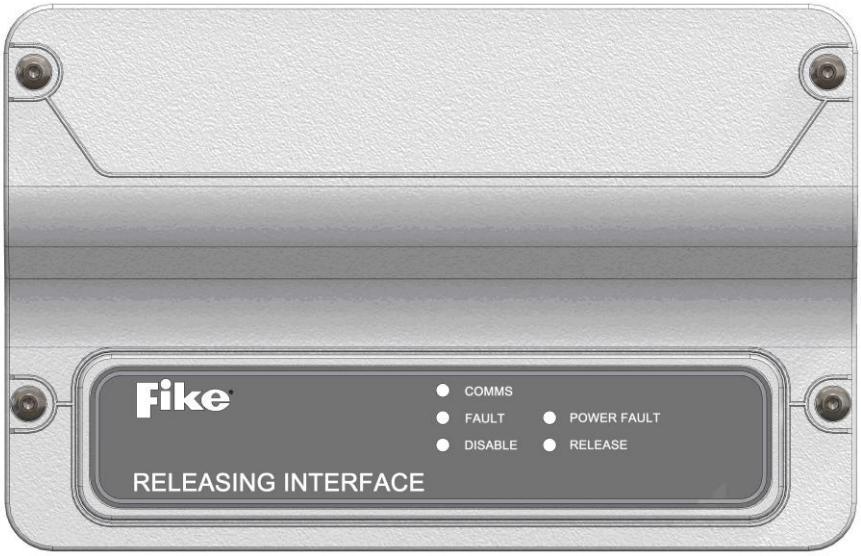
TWINFLEX® IRM



Impulse Releasing Module
100-0011

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

Impulse Releasing Module Engineering and Commissioning Manual

(TO BE RETAINED BY THE COMMISSIONING ENGINEER)

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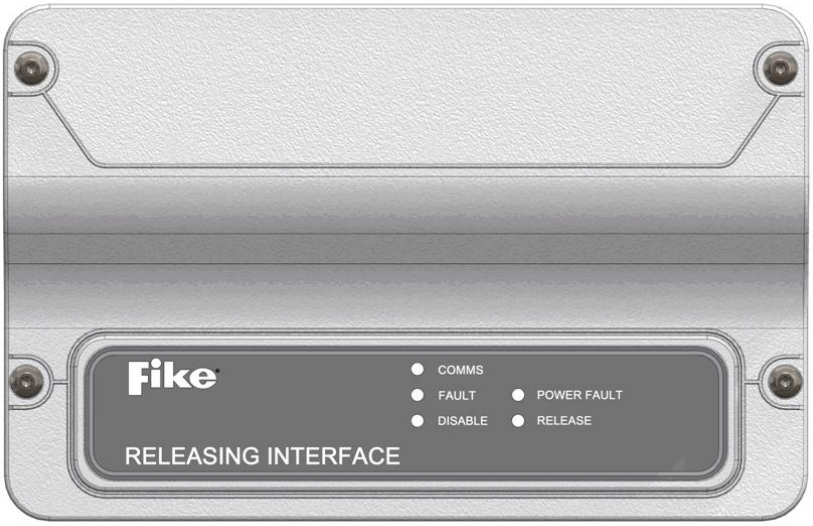
General Description

The IRM (Impulse Releasing Module) is a module that controls the operation of the IVO (Impulse Valve Operator) in a Suppression system.
The IVO is activated by the IRM to dump the Releasing agent from an impulse valve container during a Fire emergency. The IRM is equipped with three capacitors that receive a constant charging current from the releasing circuit of the control panel. When fully charged, the module is capable of firing a single IVO. The IRM 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 IRM can also be used to monitor the IVO and container for any fault conditions such as low bottle pressure, wire connections, IVO presence switch etc.

The IRM is connected to the Twinflex SRP (Single Releasing Panel) via a dedicated zone circuit.
The zone circuit is configured on the SRP as – Release IRM. A maximum of 6 IRMs can be connected on a Zone circuit. The communication between the SRP panel and IRM(s) is established via the Twinflex signaling protocol.



Before Installation

The Twinflex IRM 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 14 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).

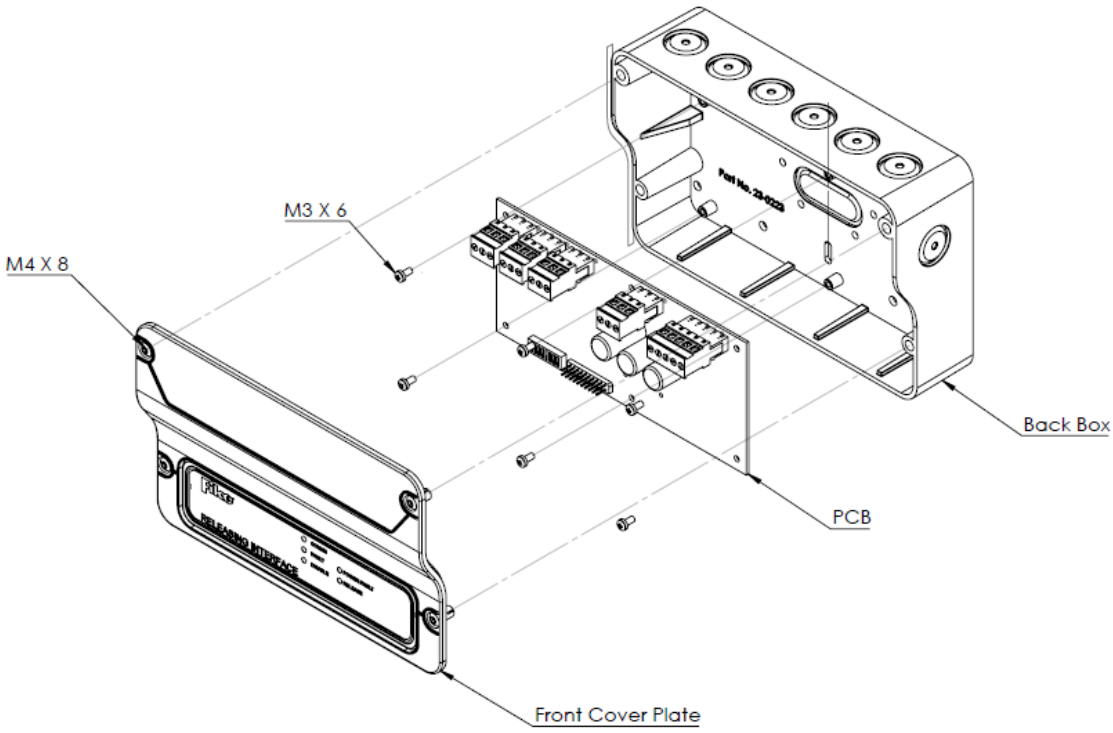


Figure 1 – IRM Layout

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 the system from responding correctly in the event of a fire.

To prevent an inadvertent extinguishant discharge, the IVO should not be connected to the pressurized container while wiring the IRM circuits and setting up the DIL switch SW1. The IVO 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 IRM may be connected and assembled.

Please remember that all high voltage testing must be carried out before the installation of the IRM 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 11). 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

Figure 2 shows the IRM layout. Terminals J1 thru J5 are used for all the field wiring connections. DIL switch SW1 is used to configure the IRM (Refer to DIL switch settings table on page 11).

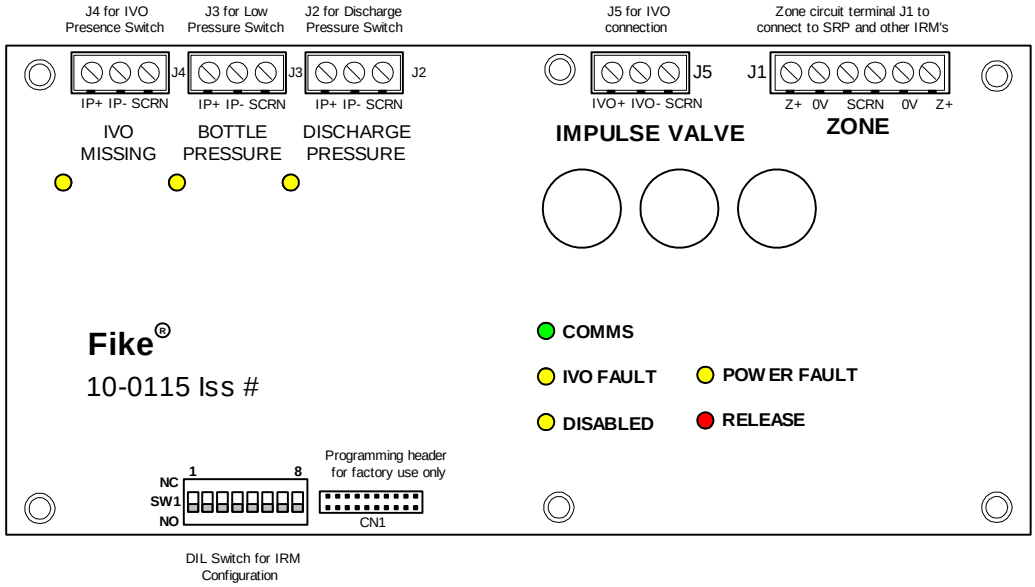


Figure 2 – IRM Board Layout

Zone Connections (J1)

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

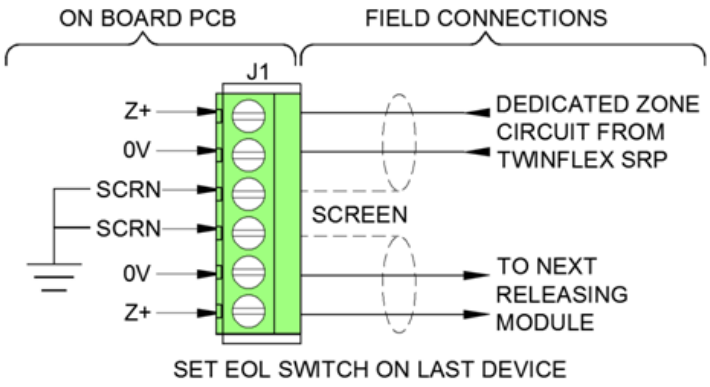


Figure 3 – Zone Connections

Please note that the “SCREEN” terminals on the IRM 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 IRMs. They are detected and annunciated by the SRP panel.

Input Connections (J2, J3, J4)

Input connections on Terminals J2, J3 and J4 are all Contact closure inputs. The Inputs can be individually configured (via DIL switch SW1) to be Normally Open or Normally Closed. Figures 4 and 5 show how to make Input connections. All Input connections are power limited and supervised.

The maximum cable length between the input device and the IRM must not exceed 3 metres.

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

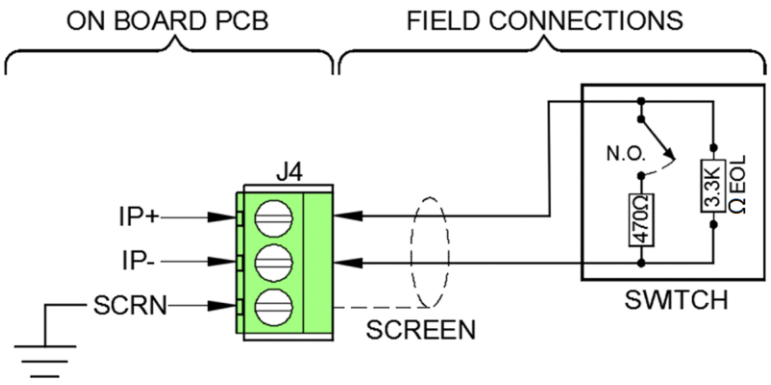


Figure 4 – Normally Open Input Connection

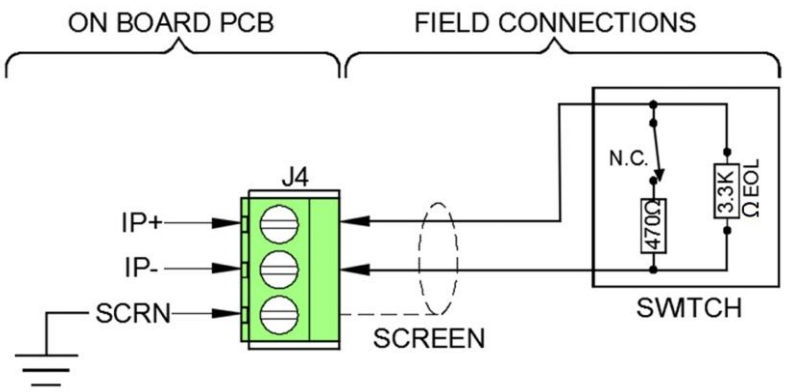


Figure 5 – Normally Closed Input Connection

Discharge pressure circuit (J2)

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 (J3)

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 Impulse valve container has a leak. The SRP panel indicates this as a Fault condition.

IVO Missing 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 – IVO Presence switch is active which indicates that the IVO has been physically removed from the Impulse valve container for maintenance or testing. The SRP Panel indicates this as a Fault condition.

IVO Coil Output Connection (J5)

This Output circuit is used to energize the IVO coil to (electrically) activate the Impulse valve and dump the Releasing agent. It is power limited and supervised. The EOL resistor (Fike part# 02-12225) and blocking diode (Fike part# 02-1544) are mounted inside the IVO connector (Fike part# 17-0143) as shown below. The assembly instructions are listed in Fike Connector Assembly Drawing No. 70-258. The maximum cable length between the IVO and the IRM must not exceed 3 metres.

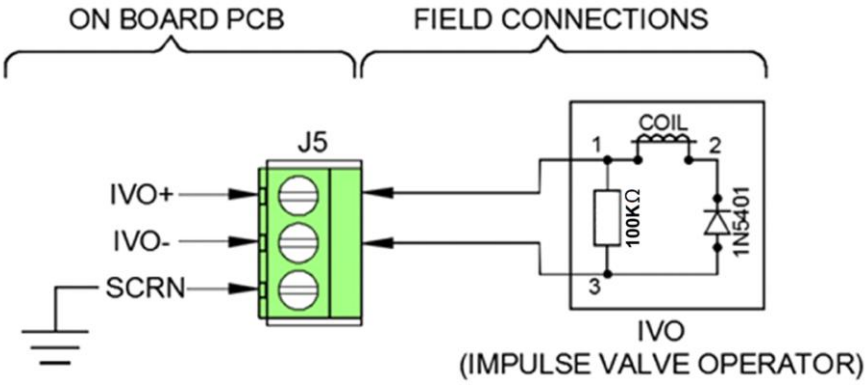


Figure 6 – IVO Connections

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 impulse operator must not be connected to the suppression container.

1. Temporarily disconnect the IVO wires from the IRM and verify that a fault signal is received by the SRP panel.

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

3. Temporarily remove the end of line (EOL) resistor across the IVO 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 IVO 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 IRM Release LED illuminates and the piston on the Impulse Valve Operator extends.

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

8. Using either a Manual Release or the detection method of the SRP panel, initiate the Release mode.

9. Verify the IRM Release LED illuminates and the piston on the Impulse Valve Operator extends.

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

11. Reset the Impulse Valve Operator as detailed on the Impulse Valve component sheet, P/N 06-492.

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

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

Arming / Disarming The System

STOP WARNING

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

To Arm the system:

1. After the system has been fully tested and restored to Normal operation, reset the IVO following the instructions provided on the Impulse Valve Operator component sheet, P/N 06-492.

STOP WARNING

The IVO must be reset after a system discharge and tank refill. Do NOT attempt to connect the IVO to the container with the pin in the extended (fired) position.

2. Connect the Impulse Valve Operator (Figure 7) to the suppression container as detailed on the Impulse Valve Operator component sheet, P/N 06-492.

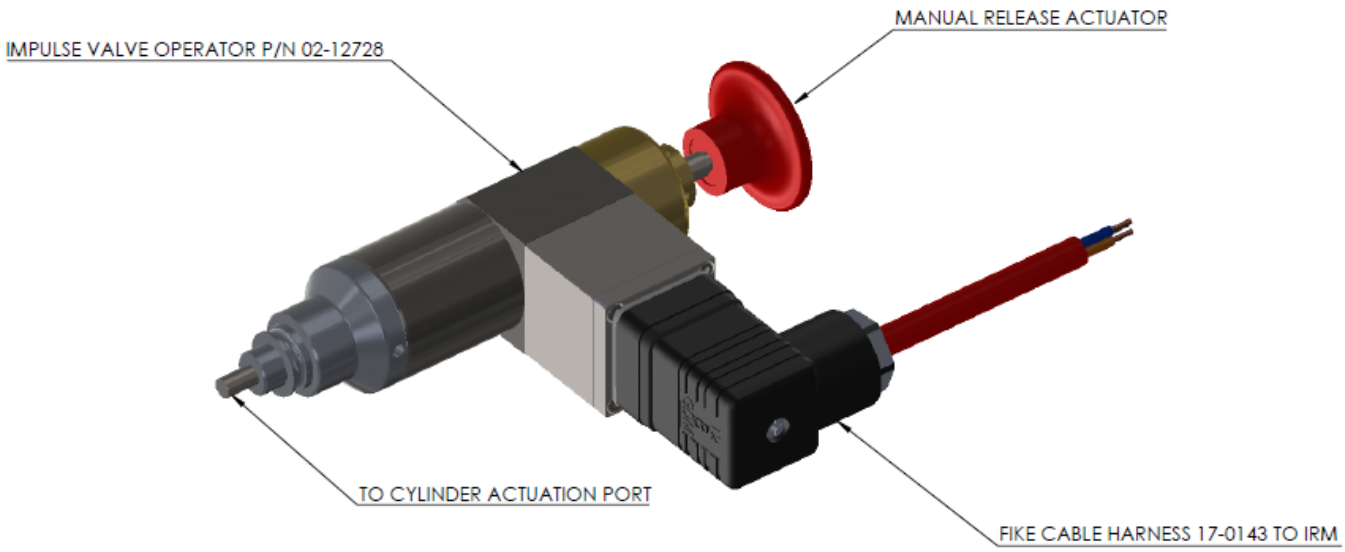


Figure 7 – Impulse Valve Operator

The EOL Assembly Part # 17-0143 is housed in the DIN Connector, see figure 6.
The maximum cable length between the IVO and the IRM must not exceed 3 metres.

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

To Disarm the system:

Disconnect the Impulse Valve Operator from the suppression container as detailed on the Impulse Valve Operator component sheet, P/N 06-492.

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 SW1 Settings

The IRM can be configured via an on board DIL switch SW1 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. ON – EOL device.
2	OFF (Default) – IRM indicates Released State only when a Discharge pressure switch activates. * ON – IRM indicates Released State when an IVO coil is energized OR a Discharge pressure switch activates. **NOTE: Only one IRM per zone circuit shall be set to activate the Discharge Pressure Switch input.**
3	OFF (Default) – Discharge pressure contact is Normally Open. ON – Discharge pressure contact is Normally Closed.
4	OFF (Default) – Bottle pressure contact is Normally Open. ON – Bottle pressure contact is Normally Closed.
5	OFF (Default) – IVO presence contact is Normally Open. ON – IVO presence contact is Normally Closed.
6	Always OFF. Unused.
7	Always OFF. Used for Factory Test mode.
8	Always OFF. 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 IRM can indicate a Released state as soon as the IVO coil is energized.

LED Table

LED Label	Pattern	Indication	State
Disabled	Fast Blink	IRM Disabled.	Disabled
	Off	IRM 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
IVO Missing	Fast Blink	IVO missing (IVO presence switch activated).	Fault
	Slow Blink	IVO presence switch wire short fault.	Fault
	Very Slow Blink	IVO presence switch wire open fault.	Fault
	Very Slow Double Blink	IVO actuator coil open fault.	Fault
	On Continuous	IVO actuator coil short fault.	Fault
	Off	IVO is connected properly to the container. Actuator coil is present and wiring is good.	Normal
Power Fault	Fast Blink	Zone power low fault.	Fault
	Slow Blink	Dump power low fault.	Fault
	Off	Power is good.	Normal
Fault	Fast Blink	A Fault condition is present on IRM. Check other LEDs to determine the Fault type.	Fault
	Off	No Fault present on IRM.	Normal
Comms	Off	IRM is not functional.	Fault
	Momentary Blink every 5 seconds	IRM is functional and communicating with SRP.	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 IRM monitors all field wiring circuits for open and short faults. A fault is indicated via on-board LEDs at the IRM. 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 for indication at the panel.

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

Automatic Activation – The SRP panel signals the IRM to activate whenever the activation condition is established. The IRM utilizes the 24 volt supervision current supplied by the SRP to charge the dump capacitors on the IRM. Upon circuit activation, the output circuit reverses its output voltage polarity, causing energy in the capacitors to be released to the IVO. The IRM signals to the SRP panel that the agent has been released. Based on the DIL switch SW1 configuration setting, either the IRM waits for confirmation from the Discharge pressure switch or it indicates a Released state as soon as the IVO coil is energized.

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

Technical Data

Dimensions:	Overall Weight……	352g
	Overall Size (W x H x D)……	189mm x 120mm x 56mm
Operating Temperature:	……	-5°C to 40°C
Voltage Range:	……	21.1V to 32V DC
Operating Current (Typical):	Quiescent……	1.73mA
	End of line ON (if applicable)…… (*in addition to Quiescent current*)	0.07mA
	Active……	3.36mA
Device Loading Units (DLUs)	……	26.6
Number of devices per zone	……	6
Max Cable Length to Inputs:	……	3 Metres
Max Cable Length to IVO	……	3 Metres
Flammability:	……	UL94-V2
IP Rating:	……	IP 30
Part Code:	……	100-0011

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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Fike Safety Technology Ltd
Unit 31, Springvale Ind. Est.
Torfaen, NP44 5BD
15
DoP-100-0011
0843-CPR-0221

Input/Output Device per EN54-18 ZA.3.
EN54-18:2005
100-0011
Intended for use in the fire detection and fire alarm - Fixed fire fighting and gas extinguishing systems in and around buildings