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APPROVAL REPORT

IRM IMPULSE RELEASING MODULE 10-2748 FOR USE WITH FM APPROVED SHP Pro, CHEETAH Xi, AND CHEETAH Xi 50 FIRE ALARM CONTROL SYSTEMS

Prepared for:
Fike Corporation
704 South 10th Street
Blue Springs, MO 64013

Project ID: 3038320
Class: 3010
Date of Approval: 22 April 2010
Authorized by:
Jim Marquedant, Group Manager

FM Approvals
1151 Boston-Providence Turnpike
PO Box 9102
Norwood, MA 02062

IRM IMPULSE RELEASING MODULE FOR USE IN FM APPROVED SHP Pro, CHEETAH Xi, AND CHEETAH Xi 50 FIRE ALARM CONTROL SYSTEMS

From

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704 South 10th Street
Blue Springs, MO 64013

I INTRODUCTION

1.1 Fike requested an examination of the IRM Impulse Releasing module P/N 10-2748. The Impulse Releasing Module [IRM] is similar to the FM Approved ARM module except for surface mount components, and larger electrolytic capacitors. The IRM is a control module that connects to the [releasing circuit of] FM Approved Shp Pro, Cheetah Xi And Cheetah Xi 50 Fire Control systems.

1.2 The SHP Pro, ARM, Cheetah Xi, and Cheetah Xi50 fire alarm control systems and module were previously Approved in Reports 3017159, 3023436 and 3029134, respectively.

1.3 This report may be freely reproduced only in its entirety and without modification.

1.4 **Standards**

Title	Class Number	Date
National Fire Alarm Code	ANSI/NFPA 72	2002

1.5 **Listing:** The product will appear in the Approval Guide, an online resource of FM Approvals as follows:

⊡Electrical Signaling ⊡Automatic Releases for Extinguishing Systems and Other Fire Protection Equipment

SHP Pro Programmable Fire Alarm Control Part No. 10-063

SHP Pro Programmable Fire Alarm Control P/N 10-063 with V1.00 firmware. Controller Part Number designation as follows:P/N 10-2452-1 for clean agent release mode/for clean agent and/or preaction sprinkler release mode/for industrial releasing mode i.e., inert gas, CO2, etc. Agent Release Module (ARM III) P/N 10-1832 is required for each Clean Agent Suppressant Container. Up to 6 ARMs can be supported by the SHP Pro. **Impulse Releasing Module (IRM) P/N 10-2748 connects to the SHP Pro releasing circuit. Up to 6 IRMs can be supported by the SHP Pro.** Two 12 V dc, up to 40 AH batteries wired in series provide the required 24 hours of secondary power. [See further description under LOCAL PROTECTIVE SIGNALING]

Cheetah Xi Programmable Fire Alarm Control Part No. 10-068

Cheetah Xi Programmable Fire Alarm Control P/N 10-068 connected to a Release Control Module P/N 55-043 or 55-048 to allow for release of extinguishing agents. Agent Release Module (ARM III) P/N 10-1832 is connected to the Release Control Module to release the agents. Up to 6 ARMs, or 2 12V solenoids, or 1 24V solenoid can be supported by the Release Module. **Impulse Releasing Module (IRM) P/N 10-2748 connects to the Cheetah Xi releasing circuit. Up to 6 IRMs can be supported by the Cheetah Xi unit.** Release initiating pull station Models 20-1343, 20-1344 are noncoded, dual action, addressable, with key lock reset feature, rated 15 to 30 Vdc, 2 mA max, semi-flush mount on standard single-gang, double-gang or 4'' square electric box. (See also LOCAL PROTECTIVE SIGNALING for details on the control).

Cheetah Xi 50Programmable Fire Alarm Control

Cheetah Xi 50 Programmable Fire Alarm Control with V1.XX firmware connected to a Release Control Module p/ns 55-043 or 55-048 to allow for release of extinguishing agents. Agent Release Module (ARM III) P/N 10-1832 is connected to the Release Control Module to release the agents. Up to 6 ARMs, or 2 12 V solenoids, or 1 24 V solenoid can be supported by the Release Module. **Impulse Releasing Module (IRM) P/N 10-2748 connects to the Cheetah Xi 50 releasing circuit. Up to 6 IRMs can be supported by the Cheetah Xi 50 unit. [See also LOCAL PROTECTIVE SIGNALING for details on the control]**

II DESCRIPTION

The following paragraphs give a brief description of the equipment covered by this report. A more detailed description of the equipment can be found in the manufacturer's Installation, Operation and Maintenance Manual. The manufacturer has made available all necessary circuit schematics and operating specifications, which have been examined and are retained on file at FM Approvals.

2.1 The Impulse Releasing Module (P/N 10-2748) is the primary interface between the supervised releasing circuit(s) of a SHP Pro, Cheetah Xi, or Cheetah Xi 50 and the [not FM Approved] Impulse Valve Operator (IVO) P/N 02-12728; which was tested with the IRM and which is used to release the fire suppressant agent from an impulse valve container.

2.2 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.

2.3 Each IRM is equipped with a red LED to provide positive indication that the module is in the active (release) state.

2.4 The maximum number of IRM's that can be connected to the releasing circuit of the respective control panel is six.

2.5 The IRM ratings are: +24V, 3.0 mA (after capacitor is charged), 20.0 mA (during capacitor charging), -37.0 mA (LED active), 32°F to 130°F (0°C to 54.4°C), 93%RH

2.5.1 The [not FM Approved] IVO ratings are: 24V.

2.6 Control panel to IRM connections are supervised and power-limited. IVO connection is: non-supervised and is power-limited. The IVO installation is restricted to the same room [20ft.] and wiring in conduit installation [as the control unit]. The IVO is susceptible to transient false activation.

III EXAMINATION

3.1 Sample of the Impulse Releasing Module [P/N 10-2748] and [not FM Approved] Impulse Valve Operator (IVO) P/N 02-12728 were connected to an FM Approved SHP Pro control unit with firmware REV level 1.00. All of the tests were conducted at Fike Corporation's facilities in Blue Springs, MO; except for Vibration, Field Wiring Transients, and Dielectric test which were performed at FM Approvals' facilities in Norwood, MA. The samples were considered to be representative of production and were examined, tested, and compared to the manufacturer's drawings. All data is on file at FM Approvals along with other documents and correspondence applicable to this program.

3.2 **Normal Operation** – Performance and functionality tests were completed as follows:

3.2.1 **Releasing Circuit** - It was verified that the Impulse Releasing Module [IRM] P/N 10-2748 connected to the releasing circuit of the SHP Pro meets (Class B) Style Y or (Class A) Style Z wiring performance as described in table 6.6.1 of NFPA 72. And, no false tripping/activation under 500 power on/off cycles.

3.3 **Voltage Variation Tests** - The 24V input power to the IRM module was varied from 85% to 110% [20.4Vdc to 27.3Vdc]. The input voltage was also varied from 18Vdc to 30Vdc.

3.3.1 All the equipment operated properly and without false signal or malfunction over the entire range of voltage variation. This is satisfactory.

3.4 **Environmental Tests** – The IRM as described in 3.1 was conditioned for periods of approximately 24 hours at 130°F (54°C), 32°F (0°C), and 100°F (38°C) at 93% relative humidity. Equipment operation was considered satisfactory during and at the end of these environmental exposures.

3.4.1 There was no adverse effect on operation as a result of the exposures.

3.5 **Electrical Utilization Equipment Tests**

3.5.1 **Electrical Shock** – The IRM module operates at 24Vdc nominal only. This is not considered to be electrical shock potential.

3.5.2 **Protective Grounding** - The IRM module operates at 24Vdc nominal only. Safety protective grounding is not required.

3.5.3 **Equipment Nameplate Rating Test** – The IRM module input voltage was varied from 20.4 to 26.4 Vdc. The maximum DC current draw of the panel was less than 110% of the rating of 3 mA in standby and 37mA in active mode.

3.5.4 **Dielectric Test** – An` IRM module was tested for one minute with a 60 Hz dielectric strength test as follows: 24Vdc input and output terminals to ground [500Vac].

3.5.5 **Radio Frequency Interference** – The IRM module connected to SHP Pro control unit was subjected to radio frequency transmissions with radiation power levels equivalent to 5 Watts at 24 inches (0.6 m) in the 27 MHz, 150-174 MHZ, 450-467 MHZ, 850-870 MHz, and 900-920 MHz bands. The system did not false alarm or give any indication of instability as a result of these exposures.

3.5.6 **Circuit Reverse Polarization** - The IRM was connected with the polarity reversed. There was no damage to the equipment. This was considered satisfactory.

3.5.7 **Surge Line Transient Tests** - The input/output circuits were subjected to transient waveforms having peak levels of 100, 500, 1,000, and 2,400 Vdc. During the testing no false alarm conditions were observed. This was considered satisfactory.

3.5.8 **Vibration Test** - The IRM module was mounted in its normal position and subjected to vertical vibration for four hours with a total displacement of 0.02 in. (0.5 mm) and a frequency sweep of 10-30-10 Hz at two cycles per minute. The module continued to operate properly during and after this test with no loose hardware or mechanical damage resulting.

IV MARKING

4.1 Because the IRM is a module that connects to one of the three FM Approved Fike control units [SHP Pro Cheetah Xi and Cheetah Xi 50], it is not required to be FM labeled. The following information is silk screened on the Impulse Releasing Module [IRM] P/N 10-2748 printed circuit board:

IRM P/N.
Installation Manual Reference.

4.1.1 A revision is assigned for each board. This is identified directly on the board.

V REMARKS

5.1 Installations shall comply with the relevant requirements of the latest edition of the National Electrical Code (ANSI/NFPA 70) and National Fire Alarm Code (ANSI/NFPA 72).

5.2 Installations shall comply with the latest edition of the manufacturer's instruction manual.

VI FACILITIES AND PROCEDURES AUDIT

The manufacturing site at Fike Corporation in Blue Springs, MO is subject to follow-up audit inspections. The facilities and quality control procedures in place continue to be satisfactory to manufacture product identical to that examined and tested as described in this report.

VII MANUFACTURERS RESPONSIBILITIES

Documentation considered critical to this Approval is on file at FM Approvals and listed in the Documentation File, Section VIII of this report. No changes of any nature shall be implemented unless notice of the proposed change has been given and written authorization obtained from FM Approvals. The Approved Product Revision Report, Form 797, shall be forwarded to FM Approvals as notice of proposed changes.

VIII DOCUMENTATION

The following drawings describe the Impulse Valve Releasing Module [IRM 10-2748 and are filed under Project 3038320.

Drawing No.	Issue	Description
02-12706	1, Jan. 5, 2010	PCB Impulse Releasing Valve Module
10-2748	N/C	Assembly Impulse Release Module
10-2748-sch	N/C	Schematic Impulse Release Module
06-552	0	0-2748 Impulse Releasing Module Product Manual

IX CONCLUSION

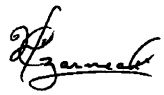
The equipment described in Section I meets FM Approvals requirements. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective the date of this report.

EXAMINATION AND TESTING BY: Henry Czarnecki

PROJECT DATA RECORD: 3038320

ATTACHMENTS: Relevant sections from manual

REPORT BY:



Henry Czarnecki
Senior Engineer
Electrical Systems

REPORT REVIEWED BY:

Patrick J. Byrne
Technical Team Manager
Electrical Systems

2.4 COMPATIBILE RELEASING DEVICES

The IRM can be used in conjunction with the control panels and devices shown in Exhibit 2. Exhibit 2 also shows the maximum number of IRM's that can be connected to the releasing circuit of the respective control panel or releasing device.

Releasing Device	IRM's per Circuit	EOLR Value
Single Hazard Panel Pro (SHP-Pro)	6	2.4KΩ
Cheetah Xi - RCM Module	6	2.7KΩ
Cheetah Xi 50 – RCM Module	6	2.7KΩ

Exhibit 2: Compatible Releasing Devices

WARNING

Any attempt to interface the IRM with a device not listed in the table above could result in damage to the module, improper operation or serious personnel injury.

3.0 OPERATION

Activation

The IRM utilizes the 24 volt supervision current supplied by the associated control panel or releasing device's output circuit to charge the capacitor on the IRM. Upon circuit activation, the output circuit reverses its output voltage polarity, causing the energy in the capacitor to be released to the Impulse Valve Operator.

Each IRM is equipped with a red LED, which when illuminated provides positive indication that the module is in the active (discharge) state or if the field wiring has been installed incorrectly.

Supervision

The IRM supervises the wiring of the Impulse Valve Operator by monitoring for opens and ground faults. Shorts on the IPV circuit are not detected.

Connect releasing circuit wiring to IRMs as shown in Exhibit 3 or Exhibit 4 below.

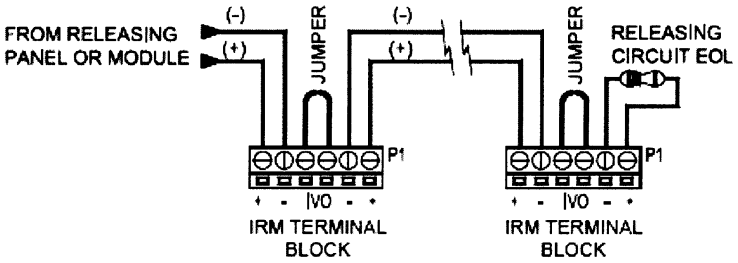


Exhibit 3: Class B (Style Y) Wiring

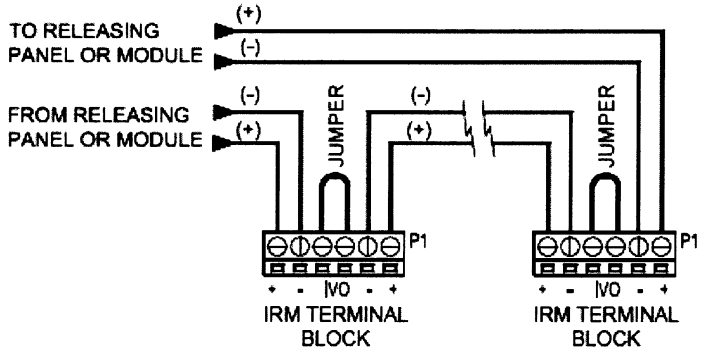


Exhibit 4: Class A (Style Z) Wiring