

# Sentinel SA1 Detection and Control System

## FEATURES

- *FM Approved: Including Environmental and Shock & Vibration Testing*
- *Rugged, Die-Cast Aluminum IP66/NEMA4X Enclosure*
- *Flexible Detection Circuits: Mixed Heat, IR, and Smoke*
- *Triple-R Protection*
- *Pre-terminated Cables*
- *Flexible Release and Shutdown Delay Options*
- *Separate Supervisory Circuit*
- *Direct Electric Discharge of Up to 3 Cylinders*
- *Three Power Options!*

## DESCRIPTION

The Kidde Fire Systems Sentinel SA1 Detection and Control System is designed to protect a wide range of small- to medium-sized vehicles/machines, including haulers, graders, forestry, waste management machines, and trucks. The Sentinel SA1 System uses a variety of technologies to detect the heat or flames produced by fires. The Sentinel SA1 System is engineered for low cost of ownership and ease of installation and service. The Sentinel SA1 is FM-approved for all vehicle types. The Sentinel SA1 has passed witnessed shock and vibration testing, and hose wash-down, giving it full FM approval and IP66/NEMA 4 rating.

The Sentinel SA1 System package offers fire protection with manual and/or automatic heat and smoke detection. Cylinder actuation can be either direct electric, using a safe protractor device, and/or via pressure actuation from a protractor operated nitrogen actuator.

## SENTINEL SYSTEM COMPONENTS

### Sentinel SA1 Controller (Sentinel SA1)

The SA1 controller is a cost-effective and versatile assembly providing a fully supervised automatic detection circuit, capable of utilizing closed contact heat detection, Linear Heat Sensing Cable (LHS), smoke detectors and/or infrared detectors. There is a separate electric remote manual release circuit and a supervisory circuit to monitor items such as cylinder pressure, if desired.

There are eight LEDs on the front of the SA1, for annunciating the conditions of the system at all times. Release delay and engine shutdown delay are separately programmable in 15 second increments, from zero up to 60 seconds each. Engine shutdown is accomplished through a form "C" contact.

The same Triple-R Protection used on the Sentinel NET system is used on the SA1 to provide protection against undesired discharge.

The case is die-cast aluminum with a gasketed die-cast aluminum cover, making the whole assembly IP66 / NEMA 4. The SA1 can be operated in three ways:



Figure 1. Kidde Sentinel SA1

1. On "primary cell" battery, with no power connection to the vehicle
2. On vehicle power with no battery backup
3. On vehicle power with one-hour rechargeable battery backup

The bottom of the SA1 includes two Deutsch Connectors, one for power and the other (twelve-pin) for all field wiring, inputs and outputs. A "splitter" is included with the SA1 that divides the output / input into the applicable connections.

Field cabling is pre-terminated with Deutsch Connectors and the cables are available in a variety of lengths to fit any measurements and requirements. The power and relay cables are terminated only where they are plugged into the SA1.

The SA1 will operate up to three electric actuators. If the actuators are applied directly to the cylinders, this allows a three-cylinder system.

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## **OTHER SENTINEL COMPONENTS**

The following components are available to expand functionality of the Sentinel System:

### **Electric Remote Manual Release**

The Electric Remote Manual Release, P/N 83-132455-000, connects directly into the Sentinel SA1 control panel via the splitter. The assembly is IP65 and is terminated with input and output connectors. The release is "dual-action," requiring 2 actions to release the fire suppression system. It can be mounted anywhere required and there is no limit to the number of electric remote manual releases that can be put into a Sentinel SA1 system.

### **Pressure Switches**

There are two types of pressure switches. Both operate from the nitrogen actuation lines when pressure actuating a system. The first can be used for engine shutdown, if applicable.

The second is the Actuation Monitor Switch, P/N 83-132510-525, used in a system that utilizes remote manual pressure release instead of, or in addition to, remote manual electric release. The Actuation Monitor Switch has an end-of-line device built in for proper supervision of the circuit. The Sentinel SA1 can be programmed for different responses, depending on the manual release type.

### **System Actuation**

The system allows two types of cylinder actuation: pressure and electric.

### **Pressure Actuation**

#### Remote System Actuator (RSA)

The Remote System Actuator, P/N 83-132514-000, provides the classic means of activating the Kidde Sentinel DCS or LS system. For automatic suppression, the RSA is electrically discharged, using an electric actuator. The non-explosive actuator is safe and easy to handle. In addition, the RSA includes a pull pin and push knob for manual activation of the system.

#### Mechanical Actuator

In addition to the RSA, a remote mechanical actuator can also be employed in the fire suppression package. These are often mounted at "ground-level," providing access to the system, without having to climb onto the machine. The mechanical actuator will operate up to 6 cylinders. Multiple mechanical actuators can be employed by using second-shot actuator assemblies.

### **Electric Actuation**

#### Direct Cylinder Actuation

The cylinder assemblies ship with actuators that can be activated both with pressure and electrically. When elec-

trically activating a cylinder, the actuator is attached to the cylinder and connects to the releasing circuit.

### **Detection**

#### Detect-A-Fire

The Detect-A-Fire (DAF) is one of the most trusted heat detectors in the marketplace. Since the late 1940s, the DAF has proven time and again that it is the most reliable spot-type heat detector for rugged environments such as (among others) mining vehicles, machines, turbines, and conveyors. In addition, the DAF is seen in mid-range operations such as paint booths, hazardous material storage buildings, and industrial processes.

#### Linear Heat Sensing Cable (LHS)

LHS Cable, P/Ns 83-100003-001, 73-200000-004, and 73-200000-005, is available in 100-meter reels. An LHS Base, P/N 83-132454-000, is used to interconnect the LHS cable with other detectors in the detection circuit. The base is IP66/NEMA 4 and has input and output Deutsch Connectors for the Initiating Circuit and sealed ports for the LHS. This allows insertion of the LHS cable anywhere in the detection circuit.

#### Infrared Detector (IR-1A)

The IR-1A detector, P/N 83-132450-000, is a dual-spectrum infrared sensor, providing flame detection in less than 100 milliseconds. For large, high-value machinery with high-pressure hydraulics, this fast detection provides the best of fire protection. In order to trip, the IR-1A must see both programmed spectrums of infrared light, including wavelengths specific to fire from hydrocarbon fuels and smoke. The range of the IR-1A, up to ~40 inches, makes this detector ideal for engine compartments, while maintaining reliable false-alarm immunity.

#### Smoke Detectors

The smoke detector base is a sealed unit (IP66/NEMA 4) that accepts both ionization and photoelectric detector heads. The base is pre-wired with Deutsch-terminated cables and can be installed anywhere in the initiating circuit. Smoke detectors are used in electrical cabinets on large shovels and other similar types of equipment.

### **Cabling**

All cabling for the Sentinel SA1 system is pre-terminated using Deutsch DT series connectors, with the initiating (detection) cabling using DTM series. Detection cables are high-temperature wired and jacketed. The power and relay cables are terminated only at one end for easy, low cost connections to appropriate contacts. All cables are IP66 or better.

An SA1 Splitter, P/N 83-132486-500, is required to adapt from the 12-pin connector to the assortment of field circuits. The splitter can be plugged directly into the Senti-

nel SA1, or a Distribution Cable, P/N 83-132486-XXX, can be plugged in and the splitter used remotely.

For the releasing circuit, an inline assembly is used for multiple cylinder actuation where required, up to three cylinders.

### Maintenance Bypass Switch

The maintenance bypass switch is wired inline with the releasing circuit. The purpose of this assembly is to enable bypassing the release of a suppression system, while maintenance and repairs are being performed on the machine. It is a key-switch device, and the key is removable in both active and bypassed positions. When a releasing circuit is bypassed, the circuit is open from the switch back to the panel, causing a “trouble” condition, while the circuit from the switch to the protractors is shunted to prevent static buildup and discharge.

Figure 3 illustrates a typical system arrangement.

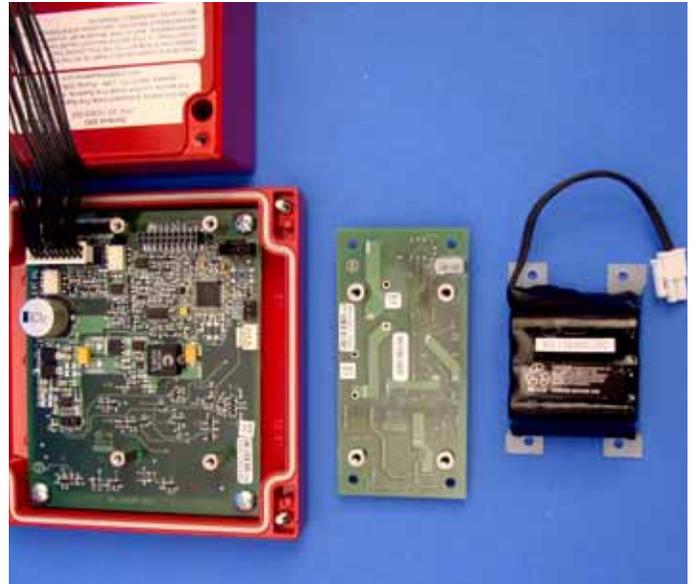


Figure 2. Kidde Sentinel SA1 Power Supply (Board) and Ni-Cad Rechargeable Back-Up Battery

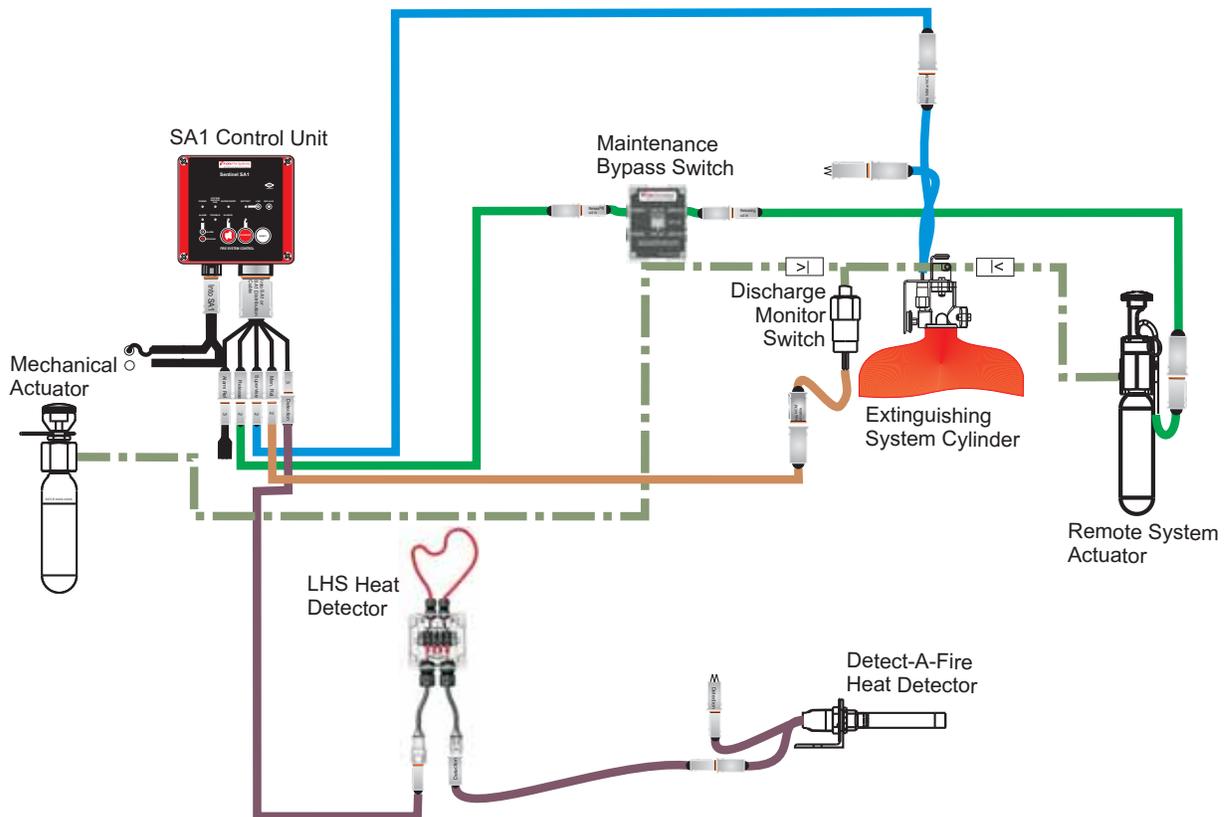


Figure 3. Example of a Typical Sentinel SA1 System (Individual systems will vary.)

## ORDERING INFORMATION

Part Number	Component
83-132400-000	Sentinel SA1 Control Panel <i>(ships without power supply)</i>
83-132400-100	Sentinel SA1 Control Panel Primary Cell Power Supply
83-132400-200	Sentinel SA1 Power Supply with Recharge Circuit
83-132400-150	Replacement Primary Cell
83-132400-250	Sentinel SA1 Rechargeable Cell Assembly
83-132481-003	Cable, Power, 3 ft.
83-132481-010	Cable, Power, 10 ft.
83-132481-025	Cable, Power, 25 ft.
83-132486-XXX	Cable, SA1 Distribution, 5 or 10 ft.
83-132486-500	Splitter, SA1 Distribution
83-132482-XXX	Cable, Detection, 2, 3, 6, 10, 25, or 50 ft.*
83-132483-XXX	Cable, 2-pin I/O (Spv, Manual Rel., Release cct.), 2, 3, 6, 10, 25, or 50 ft. *
83-132485-XXX	Cable, Relay, 6, 10, 25, or 50 ft.*
83-132487-XXX	Inline and End-of-Line Devices
83-132487-200	End of Line Device, MR/Sup/Not
83-132487-300	InLine Device, Release
83-132455-000	Remote Electric Manual Release

## ORDERING INFORMATION (CONTINUED)

Part Number	Component
83-132483-500	Maintenance Bypass Switch
83-132450-000	Dual Spectrum Infrared Detector
83-131060-001	Mounting Bracket, Infrared Detector
83-132440-275	Detect-A-Fire, 275° F, Weathertight, indexed (with mounting bracket)
83-132440-360	Detect-A-Fire, 360° F, Weathertight, indexed (with mounting bracket)
83-132440-450	Detect-A-Fire, 450° F, Weathertight, indexed (with mounting bracket)
83-132440-600	Detect-A-Fire, 600° F, Weathertight, indexed (with mounting bracket)
83-100003-001	LHS Cable, 100 meters reel (328 feet), 350° F
83-132454-000	Base, LHS Cable
Additional Data Sheets:	Sentinel NET Detection and Control System
	Sentinel LS Wet Chemical Suppression System
	Sentinel DCS Dry Chemical Suppression System
*E.g., 83-132486-XXX, substitute "005" for "XXX" for a 5-foot cable.	

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