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APPROVAL REPORT

**AutoSafe Integrated Fire and Gas System
Including AutoFieldBus Interface EAU-340,
PowerLoop Driver BSD-340, PowerLoop 4-20 mA input
unit BN-342, RS-485 interface BSD-321, BBR 110
sounders; BN series I/O devices, BW series input
disable units, X33 series flame detectors, and BF
Series Manual Fire Alarm Stations for Local Protective
Signaling**

Prepared for:

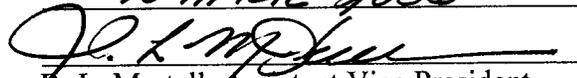
**Autronica Fire and Security AS
Haakon VII's Gate 4
N7483 Trondheim, Norway**

Project ID: 3023568

Class: 3010, 3111, 3150, 3260

Date of Approval:

Authorized by:

10 APRIL 2006

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**AutroSafe Integrated Fire and Gas System
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April 7, 2006

from

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Haakon VII's Gate 4
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I INTRODUCTION

- 1.1 Autronica Fire and Security AS requested an Approval examination of the AutoSafe Integrated Fire and Gas System using CPU firmware 3.5 for Local Protective Signaling and Automatic releasing. The equipment examined in this project are modifications of the previously Approved AutoSafe fire alarm system examined under Project IDs 3008100, 3012154, 3022074. The flame detectors examined in this project are modifications of the previously Approved AutoSafe flame detectors examined for Detector Electronics under Project IDs 3011126, 3012419, 3014814, 3016955, 3017881, 3018317, 3020383 and 3022338, and private labeled to Autronica. Examination of the gas detector operation was examined under project ID 3023566 and resulted in a separate gas detector system listing
- 1.2 This Report may be freely reproduced only in its entirety and without modification.
- 1.3 **Standards**

Title	Class Number	Date
National Fire Alarm Code	ANSI/NFPA 72	2002
Audible Signal Devices	3150	12/74
Radiant Energy-Sensing Fire Detectors for Automatic Fire Alarm Signaling	3260	August 2000
Radiant Energy-Sensing Fire Detectors for Automatic Fire Alarm Signaling	ANSI/FM 3260	February 2004

- 1.4 **Listing:** The new product will appear in the Approval Guide under Local Protective Signaling as follows:

AutroSafe Integrated Fire and Gas Alarm Control System consists of either a single control panel or a system of up to five different panels. A single BS-310 Fire Alarm Control using software designated 3.5 requires an internal BSS-103A 220Vac/ 3A-power supply. It can accommodate a maximum of 14 modules, one BSS-310 power module, one BSL-310 communication module and up to 12 optional modules. Controls are limited to six loops and a total of 512 devices. Loops can contain initiating devices or notification appliances. System power is a supervised 8.0 A at 24 Vdc from 230 Vac or a 24 Vdc, 225 Ah, six PS-12750 battery bank provided by the SC-8/24-25 .A multi-panel AutoSafe Fire Alarm Control System includes a BS-320 Control panel using the same software and power as the BS-310 and optional panels: BC-320 controller, BS-330 Operator

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Panel, BU-320 and Repeater Panel, BV-320. BX-3XX controls are suitable for operation in ambient temperatures from 32° to 140°F (0° to 60°C); the BD series heat detectors operate from -4° to 125°F (-20° to 52°C); all other peripheral devices are rated at -4° to 158°F (-20° to 70°C). The control operates on 230 V ac, 50 Hz. Two 12 V dc batteries up to 24 Ah provide the required 24 hours of standby power plus five minutes of alarm. The optional modules are: BSJ-310 output module, each of which allows for 8 programmable open collector, non-monitored 100 mA outputs; BSD-310/311 detector loop module, each of which allows for connection of one AL Com loop of 127 devices, which can be configured for Style 7 (Class A) or Style 4.5 (Class B) signaling line circuit performance, panels are limited to six loops and a total of 512 devices, loops can be initiating or notification; BSB-310 alarm output module, each of which allows for connection of 4 alarm outputs having Style Y (Class B) notification appliance circuit performance; BSE-310/320 input modules allowing for connecting 4 monitored or 8 non monitored inputs respectively. AL Com addressable initiating devices include the Models BD-200, BD-300, BD-500, and BD-501 heat detectors rated 130°F (56°C) with a maximum spacing of 25×25 ft (7.6×7.6 m); Models BH-200, BH-300 and BH-500, BH-500/S and BH-500/N photoelectric type smoke detectors BH-220, BH-320 and BH-520 photoelectric type smoke detectors with thermistor heat detection and Models BF-300, BF-300M manual fire alarm stations. The addressable interface BN-300 with SelfVerify works as a switch monitoring unit, and the BN-310 without SelfVerify provides a relay output from the AL Com detector loop. The BNB-330 allows connection of conventional initiating devices. The BN-201 allows the connection of supervisory devices to the AL Com. Relay output equipment can be connected to the loop with a BN-320 I/O unit. BN-320/02 is specifically for door control. BN320/04 is the standard control unit and the BN-320/05 is for sprinkler system monitoring. The BNB-300 allows connection of a conventional detector circuit to the AUTROLON Loop. An addressable notification device, the BBR-110 addressable sounder is available to be connected to a BSD-31X loop as an alarm notification device. The addressable BBR-110 mounts under the base of a BD or BH series detector. The AUTROLON ring loop may connect to a BSL-321 or BSL-322 fiber optic converter or a BSL 325 AUTROLON booster in order to extend the length of the cables between panels on the AUTROLON ring. The BSL-330 Modbus converter can be connected to the AutoCom Serial output to provide remote fire control monitoring. An EAU-321 serial port communications board and EAU-341 AutoFieldBus driver in the panel will establish an AutoFieldBus to communicate with BSD 321 RS485 converter unit enabling connection to Micropack Flame detectors, Kidde-Fenwal AnaLASER HSSD., BSD-341 PowerLoop driver to connect to X33AF PL Flame detector and BN-342/1, 342/2 PowerLoop 4-20 mA input units enabling connection to Detector Electronics X3301 flame detector.

See also listing under combustible gas detector, fixed.

- 1.5 An Approval examination of modular, programmable equipment such as this can only evaluate typical configurations. Although all components have been tested, it is beyond the scope of such an examination to test all possible configurations. It is therefore necessary that those responsible for the design and acceptance of specific installations take special care to verify that their system is configured to operate properly for the required application.

II DESCRIPTION

- 2.1 The following sections contain a brief description of the equipment examined for this report. The manufacturer has made available all necessary component information, handbooks and specification sheets, which have been examined and are on file at FM Approvals. A listing of these documents is found in Section VIII of this report.

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2.2 The following table lists the new equipment examined under this project.

Model	Description	Type of equipment
EAU 321	Serial Port Communication Board	control
EAU 341	AutroFieldBus Driver	control
BSD 340(341)	Power Loop Driver	control
BN 342	PowerLoop 4-20 mA Input unit	control
BN 342/1	Power Loop 4-20 mA input unit	control
BSS-310A	Power Module (similar to BSS-310, 3008100)	control
SC-8/24-25	Power Supply/Battery charger POWEC SC8/24-25 C Powersonic PS-12750 12V 75 Ah batteries, Enclosure, marking	control 230 Volt unit
BSD-321	AutroFieldBus Protocol Converter	control
BSB-310	Monitored output module	control
BSD-310/320	Loop driver module	control
BSE-310	Input Module	control
BSL-321	Multi-mode Fiber optic Converter	control
BSL-322	Single mode fiber optic converter	control
BSL-325	AUTROLON Booster	control
BSL-330	Modbus Converter	control
BN 201	Monitoring input unit	I/O
BN 320	Unit with SelfVerify	I/O
BN-320/02	Door control	I/O
BN-320/4	Standard Control Unit	I/O
BN-320/5	Sprinkler operation indicator max 1A @30 Vdc	I/O
BN-330	Conventional Loop Interface with/without	I/O
BNB-330	housing	
BW-200	Disable input unit	I/O
BW-201	Disable Input unit with Timer	I/O
BBR-110	Addressable Socket sounder	I/O
BBR-200	Addressable sounder	I/O
X33/AF	Flame detector, 4-20 mA	Initiating
X33/AFPL	Flame detector, PowerLoop	Initiating
Micropack CCTV	Flame detector, RS485	Initiating
Phoenix, REL- MR-24DC/21	Relay	control
Phoenix, REL- MR- 24DC/21AU	Relay	control

2.3 The Control panel BS-310/320 with software Rev. 3.5, EAC-300 processor board Rev. 5, BSR-310C display board Rev. 0, EAU-310 LON interface board Rev. 1, BSZ-310 operator board Rev. 3, and BSF-310B connection module Rev. 3 is an analog addressable controller. It is capable of displaying alarm/trouble conditions. It has provisions for up to seven modules. The panel has two RS-232 ports for connection to remote printing devices or laptop computers for programming and configuration. The BS-310 is a stand-alone unit. The BS-320 is designed to be connected to a system of panels.

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- 2.4 Required modules mounted in the controller are:
- 2.4.1 The BSS-103A power supply module provides 24 Vdc at 3A for operation of the system. The 24 V power is provided to the BSS-103A by the SC-8/25-25 power supply (see paragraph 2.6). The BSS-103A provides power to the front panel boards through BSF-310B connection module; and for the modules through the power module BSS-310A/02.
 - 2.4.2 BSS-310A/02 module provides 24V dc and 5V dc for all the modules in the BS 320 from the BSS-103 power supply module.
 - 2.4.3 BSL-310 communication module provides a single RS232 connection allowing communication between the external modules and the panel.
 - 2.4.4 BSL-321/322 Multi and Single mode Fiber optic converters allow fiber optic communication between widely separated system components. The BSL-321/322 fiber optic converters enable the AUTROLON ring to be extended up to 3km between-321/322 Multi and Single mode Fiber optic converters. This provides fiber optic communication between widely separated system components.
 - 2.4.5 BSL-325 AUTROLON booster enables a larger AUROLON network. Booster increases the maximum copper wired AUTROLON communications circuit to be 2.8 km rather than the 1km standard copper wire is limited to.
- 2.5 The following modules are installed in the controls to test various equipment:
- 2.5.1 The monitored output module, BSB-310, provides four monitored output circuits Style Y (Class B) notification appliance circuit performance. Each circuit is rated maximum of 1 A (3 A/module) 24 V dc for alarm sounders, fire alarm devices, fire alarm routing equipment, fire protection equipment and other fault outputs.
 - 2.5.2 The loop driver module, BSD-310 can drive up to 127 addressable devices. The BSD-310 is capable of driving a 50-ohm circuit with a maximum current of 140 mA. The BSD-311 is capable of driving a 20-ohm circuit with a maximum current of 250 mA. Both modules, BSD-310/311 can each be configured for either Style 7 (Class A) or Style 4.5 (Class B) signaling line circuit performance.
 - 2.5.3 The Input modules BSE-310/BSE-320 provide the capability of providing digital input signals to the Fire Alarm Control Panel for supplemental control functions.
 - 2.5.4 The AUTROFIELDBUS Driver EAU-341 mounted in the panel can communicate with up to 31 bus units. The bus units can be either the BSD-321 to connect to RS485 devices, the BN 342 or BN342/1 to connect to 4-20 mA devices or BSD 341 PowerLOOP drivers. The EAU-321 interfaces with the AUTROLON communications system through the EAU-341.
 - 2.5.5 The output module BSJ-310 provides eight non monitored open collector outputs that each can drive 100 mA current for supplemental purposes. Unsupervised outputs cannot be used for functions required for Approval.
- 2.6 The power supply/battery charger SC 8(24-25) provides 8.0 A at nominal 24 Vdc (actual 27.3 Vdc) when powered by either 240 Vac main voltage or 24Vdc from the battery bank. The power supply/battery charger provided for testing is only rated for 240Vac input.

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- 2.7 The information panel, BV-320 operating with software Rev. 3.5 and hardware BSR-310 display board Rev. 1, and BSF-310B connection module Rev. 3, is intended to provide information on a designated operating zone within the protected premises. The BV-320 provides the same information that is displayed on the main control panel BS/BC-320.
- 2.8 The repeater panel, BU-320 operating with software Rev. 3.5 and hardware BSR-310 display board Rev. 1, and BSF-310B connection module Rev. 3, is intended to provide remote alarm signal deactivation and reactivation and alarm reset capabilities.
- 2.9 The BN series of input units consist of the BN-300, BN-300M, and BN-201. The BN-300/ BN-300M input units with self verify are both intended to interface contact closure type detectors onto the AutoSafe detector loop. "SelfVerify" feature of AutoSafe initiating devices and initiating device interfaces enables the system to test each device daily. A calibrated signal is sent to each "SelfVerify" equipped device and if it fails to return the appropriate signal a trouble condition is annunciated. The BN-201 input unit provides a means to monitor a contact switch (N.O. or N.C.) from external equipment in order to monitor the status of this equipment. (Normal / fault etc). The AutoSafe panel can be configured to give a specific message describing the status of the monitored equipment when the input of the BN-201 is activated.
- 2.10 The BN-320/x series of input/output units provide various control functions from the Autosafe detector loop. The BN-320/2 is door control. The BN-320/4 is a "standard" control unit. The BN-320/5 is a sprinkler monitoring unit with an output capable of switching 1 A at up to 30 Vdc upon being signaled of a waterflow event.
- 2.11 The BN-330 conventional detector interface allows connection of conventional detectors to the Autronica signaling line circuit loop.
- 2.12 The BW-200 and BW-201 input disable units permit disabling one or a number of detection zones. The BW-200 disables the input for a time preset on the control during commissioning and the BW-201 allows input from a settable timer.
- 2.13 The heat and smoke detector heads are designed to fit onto the Model BWA-100 Base which communicates back to the BSD-310/-311 module in the fire alarm control via a two-wire or four-wire signaling line circuit. The detector heads themselves carry the same designation as the complete detector-base assembly but with an additional character in the designation, for example a heat detector BD-300 is equipped with a detector designated BDH-300.
- 2.14 The BBR-110 is an addressable sounder that mounts under an addressable detection device and is capable of being connected to a signaling line circuit. The rated detection loop voltage of 14 to 27 Vdc produces a sound level output of 90 dBA (referenced to 20 uPa) at 10 ft. (3m).
- 2.15 The BBR-200 is an addressable sounder capable of being connected to a signaling line circuit. The rated detection loop voltage of 14 to 27 Vdc produces a sound level output of 90 dBA (referenced to 20 uPa) at 10 ft. (3m).

III EXAMINATIONS AND TESTS

- 3.1 Samples as detailed below were submitted for examination and testing. The samples were considered to be representative of the product line 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.

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- 3.2 A sample of the AutoSafe Integrated Fire and Gas system was examined and tested at FM Approvals in Norwood, MA. The AutoSafe control system consisted of an AutoSafe control unit BS-310/01 (s/n 070451023) including: BSD-310 loop module, BSD-310/N loop module, BSB-310 output module, BSE 310 BSS-103 power supply and battery, an operator panel, BS-330 (s/n 000014001), a controller BC-320 (s/n 000028006) including: BSD-310, loop module, BSD-311, loop module, BSB-310 output module, BSI-310 output module, BSS-103 power supply, a display panel BV-320 (s/n 000031020) and a repeater panel BU-320 (s/n 000031018). The signal line alarm initiating devices included in the operational examination were: BH-200, -300, -500, -500/S, -500/Ex, -500/S/Ex, and -500/N optical smoke detectors; BH-220, -320, -520, -520/Ex, and -520/S multisensor detectors; BD-200, -300, -500, 500/Ex, -500/N, -501, -501/Ex heat detectors; BF-300, -300M/N manual call points. The interface units, BN-300, BN-310 and BN-330, allow connection of conventional initiating devices such as smoke detectors and flame detectors through the signaling line circuits. The sample of the AutoSafe Integrated Fire and Gas system was examined and tested at Autronica Fire and Security AS in Trondheim, Norway and confirmed as performing to the same standards as the system as tested at FM Approvals.
- 3.3 **Operational Tests** - The AutoSafe fire Integrated Fire and Gas system was powered with various initiating devices and modules and tested to verify proper operation under normal conditions. The equipment functioned as described in section 2 and in the critical Autronica documents, Design Guidelines AutoSafe IFG, drawing number 116-P-ASAFE-IFG-GUIDELINES/XE, revision 05-05-18, Introduction AutoSafe IFG, drawing number, 116-P-ASAFE-IFG-INTRO/XE, revision 05-05-18, and System Description AutoSafe IFG, drawing number 116-P-ASAFE-IFG/XE, revision B.
- 3.4 **Line Supervision Testing** - The signaling line circuits including the and notification appliance circuits of the AutoSafe control were tested to verify that they met the appropriate performance requirements as described in ANSI/NFPA 72-2002 Edition, Tables 3-6 and 3-7. Open, ground, and wire to wire short circuit faults were introduced into the panel.
- 3.4.1 **Signaling Line Circuits** - It was verified that the BSD-310 signaling line circuit can be configured to meet either the requirements of ANSI/NFPA 72-2002 Table 6.6 Style 7 (Class A) or the requirements of Style 4.5 (Class B) performance. The signaling line circuit can be used with a BBR-110 or BBR-200 sounder as a signal line notification appliance driver. These results were satisfactory.
- 3.4.2 **AutoFieldBus**—It was verified the AutoFieldBUS circuit connecting the EAU 341, BSD341 and BSD 321 can be configured to meet the requirements of ANSI/NFPA 72-2002 Table 6.6 Style 7 (Class A) or the requirements of Style 4.5 (Class B) performance. These results were satisfactory.
- 3.4.3 **4-20 mA Circuits**— It was verified the circuit connecting detectors to the BN 342 can be configured to meet the requirements of ANSI/NFPA 72-2002 Table 6.6 Style 7 (Class A) or the requirements of Style 4.5 (Class B) performance. These results were satisfactory.
- 3.4.4 **PowerLoop circuits**- It was verified the circuit connecting detectors to the BSD 341 can be configured to meet the requirements of ANSI/NFPA 72-2002 Table 6.6 Style 7 (Class A) or the requirements of Style 4.5 (Class B) performance. These results were satisfactory.
- 3.4.5 **RS485** - It was verified the circuit connecting the detectors to the BSD 321 can be configured to meet the requirements of ANSI/NFPA 72-2002 Table 6.6 Style 7 (Class A) or the requirements of Style 4.5 (Class B) performance. These results were satisfactory.

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- 3.4.6 **Notification Appliance Circuits** - It was verified that the BSB-310 monitored output module can be configured to meet the requirements of ANSI/NFPA 72-1999 Table 3-7 Style Y (Class B) performance. These results were satisfactory.
- 3.5 **Alarm Signals** - Tests were conducted to verify the alarm signals and the silencing of these signals were in accordance with NFPA 72 requirements. An alarm condition is indicated by an LED on the front panel, zone description on the LCD on the control and by an LED on the BSD-310 module of the signaling line circuit in alarm. Notification appliances driven by the BSB-310 and the panel's audible sounder can be silenced at the control either with the push button on the front panel or with a key while maintaining the visible alarm indications. Entering an access code on the keyboard enables the alarm silence push button. A silenced alarm will resound upon receipt of a new alarm condition on a different circuit or addressable device on the same circuit. These results were satisfactory.
- 3.6 **Trouble Signals** - Tests were conducted to verify the trouble signals and the silencing of these signals according to NFPA 72 requirements. An LED and LCD display on the front panel of the control, and an indicator LED on the module of the circuit in trouble indicates a trouble condition. The distinctive trouble buzzer can be silenced by the acknowledge button on the front panel or with a key while maintaining the visible trouble indication until the source of the trouble is removed. The acknowledge push button is enabled by entering an access code on the keyboard. An acknowledged, unresolved, trouble resounds after twenty-four hours. These results were satisfactory.
- 3.7 **Voltage Variation Tests** - The input power to the AutoSafe was varied from a high value of 110% of nominal, 264 V ac, to a low value where the supply voltage transfers (transfer voltage) from the ac line to the battery secondary, which occurred at 156 V ac. It was confirmed the transfer occurs at lower than 85% of the nominal ac voltage, or 204 Vac. The battery was replaced with a variable dc supply. The dc voltage was varied from a low of 85% of 24 Vdc, 20.4 V dc, to a high of the battery float voltage of 27.6 V dc. The higher value is above the limit of 110%, 26.4 V dc, required of the test. The equipment operated as intended over the entire voltage range. These results were satisfactory.
- 3.8 **Secondary Power Supply tests** - Transfer to secondary power was accomplished automatically in less than 10 seconds upon loss of primary power to the system. Transfer to secondary power occurred at 156 V ac. The equipment operated properly before and after transfer to secondary power. Loss of primary power was annunciated as a trouble on the LCD display and loss of power to the indicating LED on the control panel. The standby battery is monitored for presence of voltage at the point of connection. Once the battery was disconnected, a battery trouble condition was indicated within 200 seconds as required. These results were satisfactory.
- 3.9 **Environmental conditioning** - Tests were conducted that verified proper operation of the AutoSafe system including devices BS-320, BH-300, BH-320, BD-300, BN-300 and BN-320. With rated power applied, the system operated satisfactorily without indication of false alarm or malfunction when subjected to ambient temperatures of 14°F (-10°C) and 130°F (60°C) for 24 hours each and twenty-four hours at an ambient temperature of 104°F (40°C) and a relative humidity of 90%(client requested 104 °F). The system operated as intended during and at the end of these environmental exposures. These results were satisfactory.
- 3.9.1 The detector operation was similarly verified, but with different ambient conditions. These conditions were: -40°F (-40°C) for a minimum of 16 hours, 140°F (60°C) for a minimum of 16

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hours, and humidity cycling from 70°F (21°C)/50% Relative Humidity to 100°F (38°C)/90% Relative Humidity in 15 minutes.

- 3.9.2 Two samples of the BBR-200 addressable sounder were tested at nominal operating voltage were subjected to ambient temperatures of -4°F (-20°C), and 158° F (70°C), and to an atmosphere of 100°F (38°C) at 90% relative humidity for 24 hours each. At no time did the output level of the sounder drop below the 75 dBA at 10 feet required by the Approval Standard.
- 3.9.3 The power supply was evaluated when subjected to ambient temperatures of 13°F (-25°C) and 131°F (55°C) for 4 hours each and twenty-four hours at an ambient temperature of 100°F (38°C) and a relative humidity of 90%.
- 3.10 **Battery discharge/recharge-** A representative system equipped with six fully charged 12 V, 75 Ah batteries arranged to provide 24 Vdc and a capacity of 225 Ah, was allowed to power the system while in the standby mode with a load 8.0 A for 24 hours. Subsequent to the standby period, the control was subjected to a five minute alarm load of 8.3 A by putting the sample system into alarm. The system was then reconnected to the ac power and batteries put into charge. The battery bank was then successfully recharged in the required 48 hour. These results were satisfactory.
- 3.11 **Flame Detector Operational Testing-** The flame detector operation was confirmed with the same small scale test described in Project IDs 3011126, 3012419, 3014814, 3016955, 3017881, 3018317, 3020383 and 3022338 for Detector Electronics, used by Autronica as authorized by Detector Electronics, these results were satisfactory.
- 3.12 **Smoke Sensor Operational Testing** -The smoke sensors were tested while connected to a BSD-310 loop module under program 3008100, these results were satisfactory when considered with the results of the supervision requirements testing described in paragraph 3.4.
- 3.13 **Drift Compensation** - Operation of the drift compensation limit warning feature was examined under program 3008100. These previous results were satisfactory when considered with the results of the supervision requirements testing described in paragraph 3.4, as it was determined there were no changes to supervision and therefore no additional testing needed.
- 3.14 **Heat Sensor Operational Testing** - Samples of the analog addressable photoelectric type smoke sensor with heat detection were subjected to heat sensor testing under program 3008100, these results were satisfactory when considered with the results of the supervision requirements testing described in paragraph 3.4.
- 3.15 **SelfVerify Feature**- An examination was made of the operation of the out-of-tolerance warning feature for the alarm initiating devices called SelfVerify under program 3008100; these results were satisfactory when considered with the results of the supervision requirements testing described in paragraph 3.4.
- 3.16 **Audibility tests** - Samples of the BBR-200 signaling line horns were tested under program 3008100, these results were considered satisfactory. Samples of the BBR-110 signaling line horns were tested with results described below, these results were considered satisfactory.
- 3.16.1 The sound pressure level measured in the open field testing area exceeded the minimum requirement for electronic sounding devices of 75 dBA at 10 feet; a minimum of 85.7 dBA was measured.

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- 3.16.2 The BBR-110 horns were run continuously for twenty-four hours. No increase in temperature was measured.
- 3.17 **Polymeric enclosure testing**- Samples of the polymeric enclosures for the BBR-110 sounders were examined for flammability, impact resistance and mold stress to the requirements of Approval standard 3150. The samples performed satisfactorily.
- 3.18 **Manual call point testing** - Samples of the models BF-300 and BF-300 M non-coded manual fire alarm stations were tested.
- 3.18.1 Operation of the manual call points by breaking the glass required 7.5-lbs. (33.4 N) of force. This was acceptable as it was less than the maximum 10 lbs (44.5 N) requirement.
- 3.18.2 A durability test involving 500 operations of the microswitch that operates when the glass is broken was successfully performed. The manual call point successfully signaled an alarm condition before and after the test.
- 3.19 **Vibration** -the equipment was subjected to vertical vibration for four hours with a total displacement of 0.02 inches (0.5 mm) and a frequency sweep of 10 – 30 – 10 Hz at two cycles per minute. There were no loose or broken parts, nor were there any false alarms. The results of this testing in conjunction with the testing performed under project 3008100, was considered satisfactory.
- 3.20 **Dielectric tests**-Dielectric tests were conducted on both the power supply and the new BBR-110 sounders. These results were satisfactory.
- 3.20.1 The power supply was tested with 2000 V dc applied between the primary power leads short-circuited together and chassis ground and between the input and output of the power supply for one minute. The power supply was tested with 710 V dc applied between the output power leads short-circuited together and chassis ground for one minute. No arcing or dielectric breakdown was evident during or at the end of these tests.
- 3.20.2 The sounders were tested with 500 V dc applied between the electrical contacts shorted together and aluminum foil wrapped around the enclosure. No arcing or dielectric breakdown was evident during or at the end of these tests.
- 3.21 **Protective grounding** - Accessible conductive parts are all connected to a properly identified protective ground terminal by resistive paths less than one ohm. These results were satisfactory.
- 3.22 **Equipment Load Rating**- the equipment load rating is printed on a unique identifying label or data sheet for each individual module produced. This is required because the number and type of load driving modules connected determine the load current consumption of the panel. The main power supply and any connected supplemental power supplies determine the available power. The system tested including simulated loads required a maximum input current of 3.2 A ac at 8A dc output which does not exceed the maximum equipment load rating marked on the power supply. These results were satisfactory.
- 3.23 **Battery Circuit Reverse Polarization** The batteries were connected with the polarity reversed. There was no emission of flame, escape of molten or glowing particles, no explosion causing rupture and no infringement of protection against electrical shock afforded by the equipment as a result of this test. The control shut down following the test. The system functioned normally after powering down and restoring power. These results were satisfactory.

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- 3.24 **Transformer Failure** This test was waived as the equipment is powered with a switching power supply, not an isolation transformer.
- 3.25 **RFI Susceptibility** - Although not an Approval requirement, radio frequency interference (RFI) susceptibility was considered. The energized AutoSafe system, mounted in the enclosure with the enclosure door opened and connected to a representative sample of initiating devices was subjected to frequencies of 154, 467, and 852 MHz with radiation power levels equivalent to 5 watts at a distance of 24 inches (61cm) from the powered equipment circuit assemblies. The system did not false alarm or give any indication of instability as a result of these exposures. These results were satisfactory.
- 3.26 **Internally Induced Transient Tests**- Protection against internally induced transients was examined. The power to the control was cycled five hundred times while monitoring the releasing circuits for instability. The control showed no instability before, during and after these tests. No false operation of the releasing circuit was observed. These results were satisfactory.
- 3.27 **Surge Transient Tests**- Although not an Approval requirement, protection against surge line transients was considered. For this test, representative copper conductor signaling line circuits running to the fiber modem card were subjected to five transient waveforms having peak levels of 100; 500; 1,000; 1,500; and 2,400 V, as delivered into a 200 ohm load. The control showed no instability before, during and after these tests. A 6000V transient was imposed on the ac line voltage repeated 250 times as a positive going pulse and 250 times as a negative going pulse. The control showed no instability before, during and after these tests. The equipment remained operational during and after these tests. These results were satisfactory.

IV MARKING

The following information appears on the apparatus identified in Section II and meets Standard requirements:

- Manufacturer's part number, serial number, and Revision level
- Maximum input and output ratings or reference to installation instructions
- Firmware labels showing the revision level, on microprocessors
- The FM Approvals mark

V REMARKS

- 5.1 Installations shall comply with the manufacturer's instruction manuals.
- 5.2 Installations in North America must meet the requirements of ANSI/NFPA 72.
- 5.3 This system does not include a power supply capable of operating on 120Vac, the typical operating voltage in North America.
- 5.4 This Approval does not include hazardous location suitability of the following devices: BZ-500 Safety barrier, BN-500Ex, BF-502Ex, BF-501Ex and BH-500/Ex. Hazardous Location suitability of the devices has not been performed. This examination only determined the devices did not interfere with normal fire alarm performance requirements. It is the manufacturer's intent to submit these products at some future time.

- 5.5 The BSL-330 Modbus converter allows interfacing between the fire alarm control and a programmable logic controller (PLC). Only the remote monitoring capabilities can be Approved, however these capabilities have not been examined. As there is no PLC Approved for fire alarm control applications no fire alarm panel control functions associated with the BSL-330 are Approved.

VI FACILITIES AND PROCEDURES AUDIT

The manufacturing sites in Trondheim, Norway and Minneapolis MN are subject to follow-up audit inspections. The facilities and quality control procedures in place have been found to be satisfactory to manufacture product identical to that examined and tested as described in this report.

VII MANUFACTURER'S RESPONSIBILITIES

- 7.1 As part of the listing requirements, FM Approvals requires assurance that subsequent systems produced will present the same quality and reliability as the system examined. The manufacturer shall maintain a Quality Assurance Program, which includes as a minimum: incoming, in-process, and final inspection and testing; equipment calibration; and drawing change control. The specific procedures used to control quality are best determined by the manufacturer.
- 7.2 The manufacturer shall provide installation, operating, and maintenance manual(s) with each system.
- 7.3 On 100% of production, Autronica manufactured electrical equipment shall be tested for continuity of the protective grounding system.
- 7.4 The power supplies shall be dielectric tested on 100% of production. The insulation between accessible conductive parts and the power supply input connections shall withstand for one minute, with no insulation breakdown, the application of 1000 Vac (1400 V dc) with respect to the protective ground. Alternatively, a test potential of 1200 Vac (1700 V dc) may be applied for at least one second.

WARNING: The dielectric test required may present a hazard of injury to personnel and/or property and should only be performed under controlled conditions, and by persons knowledgeable of the potential hazards of such testing to minimize the likelihood of shock and/or fire.

VIII DOCUMENTATION

The following drawings describe the AutoSafe Integrated Fire and Gas System. This documentation is on file at FM Approvals under Project I.D. 3023568. 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.

Drawing No	Revision	Drawing Title
116-BBR-110	2	BOM Addressable Sounder BBR-110

FM APPROVALS
Project ID: 3023568

116-BN-300M	0	BOM Interface unit w/ SVD
116-BN-320	0	BOM Input unit w/ SVD
116-BN-320/2	0	BOM Door control unit w/ SVD
116-BN-320/4	0	BOM Monitoring and control unit w/ SVD
116-BN-320/5	0	BOM Sprinkler control unit w/ SVD
116-BN-330	0	BOM Conventional Loop Interface
116-BN-342/1	2	BOM 4-20mA PowerLoop input unit, Rack
116-BN-342/2	2	BOM 4-20mA PowerLoop input unit, Rack
116-BNB-330	1	BOM Conventional Loop Interface
116-BSB-310	4	BOM Output Module
116-BSD321/1	2	BOM Protocol Converter, DIN rail
116-BSD340/1	5	BOM PowerLoop Driver, Rack
116-BSD340/2	5	BOM PowerLoop Driver, DIN rail
116-BSE-310	4	BOM Input Module, Monitored, DIN rail
116-BSE-320	3	BOM Input Module, DIN rail
116-BSL-321	1	BOM Multi Mode Fiber converter
116-BSL-322	0	BOM Single Mode Fiber converter
116-BSL-325	1	BOM AUTROLON Booster
116-BSS-310A	0	BOM Serial Power Module
116-EAU-321	1	BOM Serial comm board
116-EAU-341	0	BOM General Protocol Converter, DIN rail
116-GPC-1	0	BOM General Protocol Converter, DIN rail
116-P-ASAFE-IFG-GUIDELINES/XE	05-05-18	Design Guidelines AutoSafe IFG
116-P-ASAFE-IFG-INTRO/XE	05-05-18	Introduction AutoSafe IFG
116-P-ASAFE-IFG/XE	B	System Description AutoSafe IFG
7212-306.0070	99/04/11	Layout Input Module, Monitored
7212-307.0070	0	Layout PSU Protocol Converter, DIN rail
7212-363.0070	28/10/02	Layout LON Booster
7212-364.0070	0	Layout Multi/Single Mode Fiber converter
7212-366.0072	2	Layout Multi/Single Mode Fiber converter
7212-367.0005	12/03/04	Layout CPU PowerLoop input unit, DIN rail
7212-368.0006	16/12/03	Layout CPU PowerLoop input unit, DIN rail
7212-368.0006	16/12/03	Layout CPU PowerLoop input unit, Rack
7212-378.0003	29/10/04	Layout CPU Protocol Converter, DIN rail
7212-378.0003	11/10/04	Layout PSU Protocol Converter, DIN rail
9212-306.0001	4	B.O.M Output Module, Monitored, DIN rail
9212-306.0002	4	B.O.M Input Module, Monitored, DIN rail
9212-307.0001	3	B.O.M Input Module, DIN rail
9212-363.0001	1	B.O.M AUTROLON Booster
9212-364.0001	0	B.O.M Multi Mode Fiber converter
9212-364.0002	0	B.O.M Single Mode Fiber converter

FM APPROVALS
Project ID: 3023568

9212-366.0100	3	B.O.M 4-20mA PowerLoop input unit
9212-367.0001	4	B.O.M CPU PowerLoop input unit, DIN rail
9212-368.0001	5	B.O.M PSU PowerLoop input unit, DIN rail
9212-368.0001	5	B.O.M PSU PowerLoop input unit, Rack
9212-378.1001	3	B.O.M CPU Protocol Converter, DIN rail
9212-379.1001	5	B.O.M PSU Protocol Converter, DIN rail
BB-202	02-11-04	Schematic Sounder Unit BBA-110
BN-108	A	Schematic Conventional Loop Interface
BS-108	A	Schematic Conventional Loop Interface
BS-1097	99/04/08	Schematic Output Module, Monitored, DIN rail
BS-1099	99/04/08	Schematic Input Module, Monitored, DIN rail
BS-1103	99/04/08	Schematic Input Module, DIN rail
BS-1156	B	Serial port comm board connection diagram
BS-1191	02/09/20	Schematic LON Booster
BS-1192	A	Schematic 4-20mA PowerLoop input unit
BS-1192	A	Schematic Multi/Single Mode Fiber converter
BS-1200	H	Schematic CPU PowerLoop input unit, DIN rail
BS-1201	F	Schematic CPU PowerLoop input unit, DIN rail
BS-1243	97/11/07	Schematic Power Module
E-5229	B	FM Marking
EA-268C	D	Schematic CPU Protocol Converter, DIN rail
EA-269 E	E	Schematic PSU Protocol Converter, DIN rail
P-BBR110/CE	04/08/12	Data sheet Sounder Unit BBR-110
P-BN-342/1/CE	04/05/28	Data Sheet 4-20mA PowerLoop input unit, Rack
P-BN-342/2/CE	04/05/28	Data Sheet 4-20mA PowerLoop input unit, DIN rail
P-BN300M/CE	04/12/09	Data Sheet Input unit w/ SVD
P-BN320/2/CE	01/05/31	Data Sheet Door control unit w/ SVD
P-BN320/4/CE	01/05/31	Data Sheet Monitoring and control unit w/ SVD
P-BN320/5/CE	B	Data Sheet Sprinkler control unit w/ SVD
P-BNB330/CE	C	Data sheet Conventional Loop Interface
P-BSB310/CE	D	Data Sheet Output Module, Monitored
P-BSD321/CE	B	Data Sheet Protocol Converter, DIN rail
P-BSD340/1/CE	B	Data Sheet PowerLoop Driver, Rack
P-BSD340/2/CE	B	Data Sheet PowerLoop Driver, DIN rail
P-BSE310/CE	C	Data Sheet Input Module, Monitored, DIN rail
P-BSE320/CE	C	Data Sheet Input Module, DIN rail
P-BSL-321/CE	04/10/18	Data Sheet Multi Mode Fiber converter
P-BSL-322/CE	04/10/18	Data Sheet Single Mode Fiber converter
P-BSL-325/CE	02/02/27	Data Sheet AUTROLON Booster
P-BSS310A/CE	40528	Data Sheet Power Module
P-EAU-321/CE	A	Data Sheet Serial port communications board
P-X33/1/PL/DE	05-07-12	AutoFlame X33/1PL manual

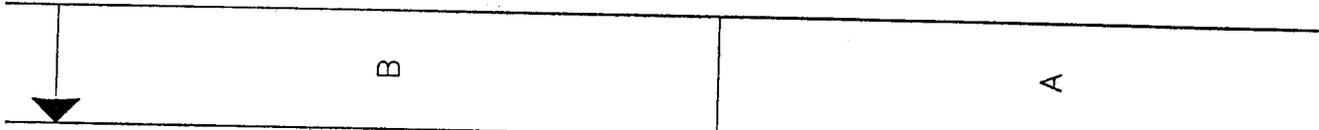
FM APPROVALS
Project ID: 3023568

The following documentation, on file at FM Approvals under Project I.D. 3008100 describes modifications examined under this project, Project I.D. 3023568.

Drawing No	Revision	Drawing Title
000505-023	A	DE dwg BNB-300/32 installation in X33AF
2148359	B	PowerLoop board assy dwg
008180,82,84,86 Test.doc	5	X33AF Process sheet
2692205	A	DE dwg DEC/Autronica PowerLoop part number document
116-BBR-110	2	BOM Addressable Sounder BBR-110
116-BN-300M	0	BOM Interface unit w/ SVD
116-BN-320	0	BOM Input unit w/ SVD
116-BN-320/2	0	BOM Door control unit w/ SVD
116-BN-320/4	0	BOM Monitoring and control unit w/ SVD
116-BN-320/5	0	BOM Sprinkler control unit w/ SVD
116-BN-330	0	BOM Conventional Loop Interface
116-BN-342/1	2	BOM 4-20mA PowerLoop input unit, Rack
116-BN-342/2	2	BOM 4-20mA PowerLoop input unit, Rack
116-BNB-330	1	BOM Conventional Loop Interface
116-BSB-310	4	BOM Output Module
116-BSD321/1	2	BOM Protocol Converter, DIN rail
116-BSD340/1	5	BOM PowerLoop Driver, Rack
116-BSD340/2	5	BOM PowerLoop Driver, DIN rail
116-BSE-310	4	BOM Input Module, Monitored, DIN rail
116-BSE-320	3	BOM Input Module, DIN rail
116-BSL-321	1	BOM Multi Mode Fiber converter
116-BSL-322	0	BOM Single Mode Fiber converter
116-BSL-325	1	BOM AutoLON Booster
116-BSS-310A	0	BOM Serial Power Module
116-EAU-321	1	BOM Serial comm board
116-EAU-341	0	BOM General Protocol Converter, DIN rail
116-GPC-1	0	BOM General Protocol Converter, DIN rail
116-P-ASAFE-IFG/XE	B	System Description AutoSafe IFG
116-P-ASAFE-IFG-GUIDELINES/XE	43225	Design Guidelines AutoSafe IFG
116-P-ASAFE-IFG-INTRO/XE	43225	Introduction AutoSafe IFG
116-P-X33AF/PL/CE	38754	Installation Datasheet X33AF PL
116-P-X33AF/PL/DE	38698	Installation Handbook X33AF PL
7212-306.0070	36261	Layout Input Module, Monitored
7212-307.0070	0	Layout PSU Protocol Converter, DIN rail
7212-363.0000	47028	Layout LON Booster
7212-364.0070	0	Layout Multi/Single Mode Fiber converter
7212-366.0072	2	Layout Multi/Single Mode Fiber converter
7212-367.0005	38324	Layout CPU PowerLoop input unit, DIN rail

FM APPROVALS
Project ID: 3023568

7212-368.0006	42707	Layout CPU PowerLoop input unit, DIN rail
7212-368.0006	42707	Layout CPU PowerLoop input unit, Rack
7212-378.0003	47395	Layout CPU Protocol Converter, DIN rail
7212-378.0003	38301	Layout PSU Protocol Converter, DIN rail
9212-306.0001	4	B.O.M Output Module, Monitored, DIN rail
9212-306.0002	4	B.O.M Input Module, Monitored, DIN rail
9212-307.0001	3	B.O.M Input Module, DIN rail
9212-363.0001	1	B.O.M AutoLON Booster
9212-364.0001	1	B.O.M Multi Mode Fiber converter
9212-364.0002	1	B.O.M Single Mode Fiber converter
9212-366.0100	4	B.O.M 4-20mA PowerLoop input unit
9212-367.0001	5	B.O.M CPU PowerLoop input unit, DIN rail
9212-368.0001	5	B.O.M PSU PowerLoop input unit, DIN rail
9212-368.0001	5	B.O.M PSU PowerLoop input unit, Rack
9212-378.1001	4	B.O.M CPU Protocol Converter, DIN rail
9212-379.1001	4	B.O.M PSU Protocol Converter, DIN rail
BB-202	38028	Schematic Sounder Unit BBA-110
BN-108	A	Schematic Conventional Loop Interface
BS-1097	36258	Schematic Output Module, Monitored, DIN rail
BS-1099	36258	Schematic Input Module, Monitored, DIN rail
BS-1103	36258	Schematic Input Module, DIN rail
BS-1156	B	Serial port comm board connection diagram
BS-1191	43870	Schematic LON Booster
BS-1192	A	Schematic 4-20mA PowerLoop input unit
BS-1192	A	Schematic Multi/Single Mode Fiber converter
BS-1200	H	Schematic CPU PowerLoop input unit, DIN rail
BS-1201	F	Schematic CPU PowerLoop input unit, DIN rail
BS-1243	35741	Schematic Power Module
E-5229	B	FM Marking
EA-268C	D	Schematic CPU Protocol Converter, DIN rail
EA-269 E	E	Schematic PSU Protocol Converter, DIN rail
P-BBR110/CE	41007	Data sheet Sounder Unit BBR-110
P-BN300M/CE	39915	Data Sheet Input unit w/ SVD
P-BN320/2/CE	11328	Data Sheet Door control unit w/ SVD
P-BN320/4/CE	11328	Data Sheet Monitoring and control unit w/ SVD
P-BN320/5/CE	B	Data Sheet Sprinkler control unit w/ SVD
P-BN-342/1/CE	46848	Data Sheet 4-20mA PowerLoop input unit, Rack
P-BN-342/2/CE	46848	Data Sheet 4-20mA PowerLoop input unit, DIN rail
P-BNB330/CE	C	Data sheet Conventional Loop Interface
P-BSB310/CE	D	Data Sheet Output Module, Monitored
P-BSD321/CE	B	Data Sheet Protocol Converter, DIN rail
P-BSD340/1/CE	B	Data Sheet PowerLoop Driver, Rack
P-BSD340/2/CE	B	Data Sheet PowerLoop Driver, DIN rail



CERTIFIED PRODUCT
 NO MODIFICATIONS PERMITTED
 WITHOUT THE APPROVAL OF THE
 "AUTHORIZED PERSON"

REV	ECO NO.	DESCRIPTION	DATE	APPROVED
P	7749	ADD FM/CSA TO -003 & -004 & CHG X33 TO X33AF.		
		ADD CONDUIT SEAL NOT REQUIRED TO -001 THRU -004, -009 & 010.		
N	7702	ADD 'CE' & WHEELED BIN TO ALL -9XX	08.19.05	KAT
		UPDATE SHL 2 SYMBOL ON -009 & -010. DELETE -005.		
M	7593	ADD BOM'S. CHG NOTE 1. CHG MATERIAL. REMOVE CE	05.11.05	KAT
		MARK FROM RUSSIAN LABELS. ADD WHEELED BIN SYMBOL		
L	7528	ADD -009 & -010. REVISE ADDRESS. ADD VDC SYMBOL.	1.19.05	KAT
		REVISE NOTE 2. 4 WATTS WAS 4.6 WATTS.		
K	7052	ADD -008 AUS. ON -003 THRU -007;	9.19.03	E.B.
		ADD DC SYMBOL. ADD RUSSIAN DATE CODE.		
J	7008	CHG TEMPS. ON LABELS -902 & -904.	8.28.03	KAT
H	6948	ADD DNV (CERT) TO -001 THRU -006.	7.24.03	CDS
G	6712	ADD -006 & -007.	6/03	KAT



DETECTOR ELECTRONICS CORP.
 MINNEAPOLIS, MINNESOTA 55438

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DO NOT SCALE DRAWING
 SCALE 1:1
 SHEET 1 OF 1
 TITLE LABEL: X3301
 DRAWING NO. D 007197-XXX
 REV P

D

C

DELTA TRONICS
 ООО «Делта Троникс», Москва, Россия
 CE X

МУЛЬТИСПЕКТРАЛЬНЫЙ (ИНФРАКРАСНЫЙ) ИЗВЕЩАТЕЛЬ ПЛАМЕНИ ПОЖАРНЫЙ
 Модель: К3301
 Заводской номер:
 Дата изготовления:

Диапазон напр. питания: 18-32 В пост. тока
 Напряжение номинальное: 24 В пост. тока
 Потребляемая мощность макс.: 17,0 Вт
 Вых сигнал: Релевный контакт

ИЗВЕЩАТЕЛЬ ПЛАМЕНИ
 МД ИСН «ИЗВЕЩАТЕЛЬ ПЛАМЕНИ»
 Сертификат №. 00017714
 18 -55С СБ 0-75С
 19 -55С СБ 0-75С
 14 -55С СБ 0-75С

007197-901 (REV. D)

DELTA TRONICS
 ООО «Делта Троникс», Москва, Россия
 CE X

МУЛЬТИСПЕКТРАЛЬНЫЙ (ИНФРАКРАСНЫЙ) ИЗВЕЩАТЕЛЬ ПЛАМЕНИ ПОЖАРНЫЙ
 Модель: К3301
 Заводской номер:
 Дата изготовления:

Диапазон напр. питания: 18-32 В пост. тока
 Напряжение номинальное: 24 В пост. тока
 Потребляемая мощность макс.: 17,0 Вт
 Вых сигнал: Релевный контакт

ИЗВЕЩАТЕЛЬ ПЛАМЕНИ
 МД ИСН «ИЗВЕЩАТЕЛЬ ПЛАМЕНИ»
 Сертификат №. 00017714
 18 -55С СБ 0-75С
 19 -55С СБ 0-75С
 14 -55С СБ 0-75С

007197-902 (REV. E)

DELTA TRONICS
 ООО «Делта Троникс», Москва, Россия
 CE X

МУЛЬТИСПЕКТРАЛЬНЫЙ (ИНФРАКРАСНЫЙ) ИЗВЕЩАТЕЛЬ ПЛАМЕНИ ПОЖАРНЫЙ
 Модель: К3301
 Заводской номер:
 Дата изготовления:

Диапазон напр. питания: 18-32 В пост. тока
 Напряжение номинальное: 24 В пост. тока
 Потребляемая мощность макс.: 17,0 Вт
 Вых сигнал: 4-20 мА

ИЗВЕЩАТЕЛЬ ПЛАМЕНИ
 МД ИСН «ИЗВЕЩАТЕЛЬ ПЛАМЕНИ»
 Сертификат №. 00017714
 18 -55С СБ 0-75С
 19 -55С СБ 0-75С
 14 -55С СБ 0-75С

007197-903 (REV. D)

DELTA TRONICS
 ООО «Делта Троникс», Москва, Россия
 CE X

МУЛЬТИСПЕКТРАЛЬНЫЙ (ИНФРАКРАСНЫЙ) ИЗВЕЩАТЕЛЬ ПЛАМЕНИ ПОЖАРНЫЙ
 Модель: К3301
 Заводской номер:
 Дата изготовления:

Диапазон напр. питания: 18-32 В пост. тока
 Напряжение номинальное: 24 В пост. тока
 Потребляемая мощность макс.: 17,0 Вт
 Вых сигнал: 4-20 мА

ИЗВЕЩАТЕЛЬ ПЛАМЕНИ
 МД ИСН «ИЗВЕЩАТЕЛЬ ПЛАМЕНИ»
 Сертификат №. 00017714
 18 -55С СБ 0-75С
 19 -55С СБ 0-75С
 14 -55С СБ 0-75С

007197-904 (REV. E)

ADDITIONAL INFORMATION:
 MULTISPECTRUM - IR FLAME DETECTOR
 MODEL: X3301
 ELEC. RATING: 18-32 VDC ---; 4.0-17 WATTS (SEE MANUAL)
 SERIAL NO.:
 DATE CODE:

CE 0539 II 2 GD
 EIA J
 EIA J
 DEMKO DT ATEX 130204
 16 (Tomb -55°C TO +75°C)
 15 (Tomb -55°C TO +75°C)
 P66

SI
 DIV 1, GRP B,C,D; CL III;
 DIV 2, GRP A,B,C,D (TSC);
 DIV 3, GRP A,B,C,D (TSC);
 DIV 4, GRP A,B,C,D (TSC);
 DIV 5, GRP A,B,C,D (TSC);
 Tomb -40°C TO +75°C, NEMA/TYPE 4X
 CONDUIT SEAL NOT REQUIRED

UC
 BY THE APPROVAL OF
 LISTED
 AND RECOGNIZED LISTING
 ORGANIZATION, INC. (UL)

CAUTION: READ AND UNDERSTAND INSTRUCTION MANUAL BEFORE OPERATING.
 WARNING: DO NOT OPEN WHEN AN OPEN FLAME OR ATMOSPHERE MAY BE PRESENT.
 007197-001 (REV. K)

007197-001 (REV. K)

ADDITIONAL INFORMATION:
 MULTISPECTRUM - IR FLAME DETECTOR
 MODEL: X3301
 ELEC. RATING: 18-32 VDC ---; 4.0-17 WATTS (SEE MANUAL)
 SERIAL NO.:
 DATE CODE:

CE 0539 II 2 GD
 EIA J
 EIA J
 DEMKO DT ATEX 130204
 16 (Tomb -55°C TO +75°C)
 15 (Tomb -55°C TO +75°C)
 14 (Tomb -55°C TO +125°C)
 P66

SI
 DIV 1, GRP B,C,D; CL III;
 DIV 2, GRP A,B,C,D (TSC);
 DIV 3, GRP A,B,C,D (TSC);
 DIV 4, GRP A,B,C,D (TSC);
 DIV 5, GRP A,B,C,D (TSC);
 Tomb -40°C TO +75°C, NEMA/TYPE 4X
 CONDUIT SEAL NOT REQUIRED

UC
 BY THE APPROVAL OF
 LISTED
 AND RECOGNIZED LISTING
 ORGANIZATION, INC. (UL)

CAUTION: READ AND UNDERSTAND INSTRUCTION MANUAL BEFORE OPERATING.
 WARNING: DO NOT OPEN WHEN AN OPEN FLAME OR ATMOSPHERE MAY BE PRESENT.
 007197-002 (REV. K)

007197-002 (REV. K)

ADDITIONAL INFORMATION:
 MULTISPECTRUM - IR FLAME DETECTOR
 MODEL: X3301
 ELEC. RATING: 18-32 VDC ---; 4.0-17 WATTS (SEE MANUAL)
 SERIAL NO.:
 DATE CODE:

CE 0539 II 2 GD
 EIA J
 EIA J
 DEMKO DT ATEX 130204
 16 (Tomb -55°C TO +75°C)
 15 (Tomb -55°C TO +75°C)
 P66

SI
 DIV 1, GRP B,C,D; CL III;
 DIV 2, GRP A,B,C,D (TSC);
 DIV 3, GRP A,B,C,D (TSC);
 DIV 4, GRP A,B,C,D (TSC);
 DIV 5, GRP A,B,C,D (TSC);
 Tomb -40°C TO +75°C, NEMA/TYPE 4X
 CONDUIT SEAL NOT REQUIRED

UC
 BY THE APPROVAL OF
 LISTED
 AND RECOGNIZED LISTING
 ORGANIZATION, INC. (UL)

CAUTION: READ AND UNDERSTAND INSTRUCTION MANUAL BEFORE OPERATING.
 WARNING: DO NOT OPEN WHEN AN OPEN FLAME OR ATMOSPHERE MAY BE PRESENT.
 007197-003 (REV. J)

007197-003 (REV. J)

ADDITIONAL INFORMATION:
 MULTISPECTRUM - IR FLAME DETECTOR
 MODEL: X3301
 ELEC. RATING: 18-32 VDC ---; 4.0-17 WATTS (SEE MANUAL)
 SERIAL NO.:
 DATE CODE:

CE 0539 II 2 GD
 EIA J
 EIA J
 DEMKO DT ATEX 130204
 16 (Tomb -55°C TO +75°C)
 15 (Tomb -55°C TO +75°C)
 14 (Tomb -55°C TO +125°C)
 P66

SI
 DIV 1, GRP B,C,D; CL III;
 DIV 2, GRP A,B,C,D (TSC);
 DIV 3, GRP A,B,C,D (TSC);
 DIV 4, GRP A,B,C,D (TSC);
 DIV 5, GRP A,B,C,D (TSC);
 Tomb -40°C TO +75°C, NEMA/TYPE 4X
 CONDUIT SEAL NOT REQUIRED

UC
 BY THE APPROVAL OF
 LISTED
 AND RECOGNIZED LISTING
 ORGANIZATION, INC. (UL)

CAUTION: READ AND UNDERSTAND INSTRUCTION MANUAL BEFORE OPERATING.
 WARNING: DO NOT OPEN WHEN AN OPEN FLAME OR ATMOSPHERE MAY BE PRESENT.
 007197-004 (REV. J)

007197-004 (REV. J)

ADDITIONAL INFORMATION:
 MULTISPECTRUM - IR FLAME DETECTOR
 MODEL: X3301
 ELEC. RATING: 18-32 VDC ---; 4.0-17 WATTS (SEE MANUAL)
 SERIAL NO.:
 DATE CODE:

CE 0539 II 2 GD
 EIA J
 EIA J
 DEMKO DT ATEX 130204
 16 (Tomb -55°C TO +75°C)
 15 (Tomb -55°C TO +75°C)
 P66

SI
 DIV 1, GRP B,C,D; CL III;
 DIV 2, GRP A,B,C,D (TSC);
 DIV 3, GRP A,B,C,D (TSC);
 DIV 4, GRP A,B,C,D (TSC);
 DIV 5, GRP A,B,C,D (TSC);
 Tomb -40°C TO +75°C, NEMA/TYPE 4X
 CONDUIT SEAL NOT REQUIRED

UC
 BY THE APPROVAL OF
 LISTED
 AND RECOGNIZED LISTING
 ORGANIZATION, INC. (UL)

CAUTION: READ AND UNDERSTAND INSTRUCTION MANUAL BEFORE OPERATING.
 WARNING: DO NOT OPEN WHEN AN OPEN FLAME OR ATMOSPHERE MAY BE PRESENT.
 007197-006 (REV. E)

007197-006 (REV. E)

ADDITIONAL INFORMATION:
 MULTISPECTRUM - IR FLAME DETECTOR
 MODEL: X3301
 ELEC. RATING: 18-32 VDC ---; 4.0-17 WATTS (SEE MANUAL)
 SERIAL NO.:
 DATE CODE:

CE 0539 II 2 GD
 EIA J
 EIA J
 DEMKO DT ATEX 130204
 16 (Tomb -55°C TO +75°C)
 15 (Tomb -55°C TO +75°C)
 14 (Tomb -55°C TO +125°C)
 P66

SI
 DIV 1, GRP B,C,D; CL III;
 DIV 2, GRP A,B,C,D (TSC);
 DIV 3, GRP A,B,C,D (TSC);
 DIV 4, GRP A,B,C,D (TSC);
 DIV 5, GRP A,B,C,D (TSC);
 Tomb -40°C TO +75°C, NEMA/TYPE 4X
 CONDUIT SEAL NOT REQUIRED

UC
 BY THE APPROVAL OF
 LISTED
 AND RECOGNIZED LISTING
 ORGANIZATION, INC. (UL)

CAUTION: READ AND UNDERSTAND INSTRUCTION MANUAL BEFORE OPERATING.
 WARNING: DO NOT OPEN WHEN AN OPEN FLAME OR ATMOSPHERE MAY BE PRESENT.
 007197-007 (REV. E)

007197-007 (REV. E)

ADDITIONAL INFORMATION:
 MULTISPECTRUM - IR FLAME DETECTOR
 MODEL: X3301
 ELEC. RATING: 18-32 VDC ---; 4.0-17 WATTS (SEE MANUAL)
 SERIAL NO.:
 DATE CODE:

CE 0539 II 2 GD
 EIA J
 EIA J
 DEMKO DT ATEX 130204
 16 (Tomb -55°C TO +75°C)
 15 (Tomb -55°C TO +75°C)
 P66

CAUTION: READ AND UNDERSTAND INSTRUCTION MANUAL BEFORE OPERATING.
 WARNING: DO NOT OPEN WHEN AN OPEN FLAME OR ATMOSPHERE MAY BE PRESENT.
 007197-007 (REV. E)

D

C

AUS Ex 03.2581X

DATE CODE: T4 (Temp -55C TO +125C) P68 007197-007 (REV. E) ATMOSPHERE MAY BE PRESENT. 007197-007 (REV. E)

ADTECHNICS
 MULTISPECTRUM - IR FLAME DETECTOR
 MODEL: X3301
 ELEC. RATING: 18-32 VDC
 SERIAL NO.:
 DATE CODE:
 ELEC. RATING: 18-32 VDC
 SERIAL NO.:
 DATE CODE:
 007197-008 (REV. C)

007197-007 (REV. E)

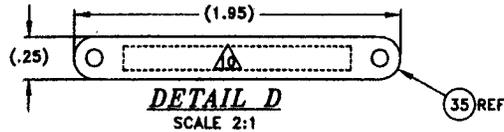
ADTECHNICS
 MULTISPECTRUM - IR FLAME DETECTOR
 MODEL: X3301
 ELEC. RATING: 18-32 VDC
 SERIAL NO.:
 DATE CODE:
 007197-009 (REV. D)

007197-008 (REV. C)

ADTECHNICS
 MULTISPECTRUM - IR FLAME DETECTOR
 MODEL: X3301
 ELEC. RATING: 18-32 VDC
 SERIAL NO.:
 DATE CODE:
 007197-010 (REV. D)

007197-009 (REV. D)

1. MATERIAL: SEE BILL OF MATERIAL.
 IMAGE: SCREEN GLOSS BLACK OR LASER MARKED IMAGE.
 CHARACTERS PER MIL-1-43553.



SURFACE FINISH TO BE 32RMS OR BETTER FOR THESE FEATURES:
 BULKHEAD (ITEM 4) CYLINDRICAL JOINT MAX. DIA.: #3.2024
 COVER (ITEM 1) CYLINDRICAL JOINT MIN. DIA.: #3.1965
 CYLINDRICAL JOINT MAX. GAP: .0059

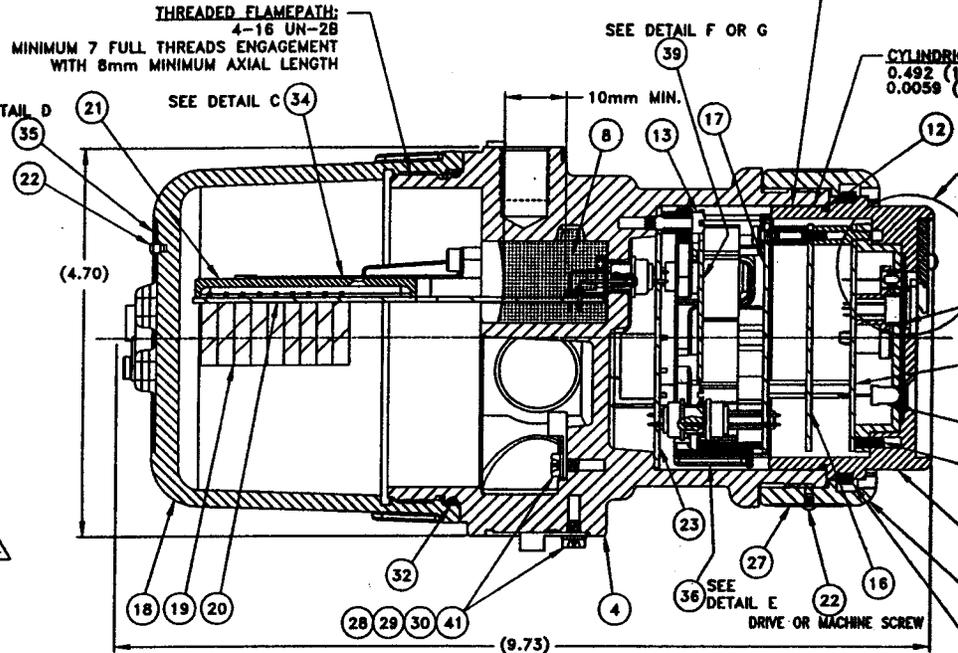
SURFACE FINISH TO BE 32RMS OR BETTER FOR THESE FEATURES:
 BULKHEAD (ITEM 4) CYLINDRICAL JOINT MIN. DIA.: #3.2009
 COVER (ITEM 1) CYLINDRICAL JOINT MAX. DIA.: #3.1982
 CYLINDRICAL JOINT MIN. GAP: .0027



DETAIL C
HART I/F BD, TOP SIDE



DETAIL F
LON CPU BD, BOTTOM SIDE



SECTION A-A

8. ROUTINE (100%) FACTORY TESTING:
 THE EQUIPMENT AT THE CONCLUSION OF MANUFACTURE AND BEFORE SHIPMENT MUST WITHSTAND WITHOUT BREAKDOWN, THE APPLICATION OF THE APPROPRIATE DIELECTRIC STRENGTH TEST:

FIELD WIRING TERMINALS	DIELECTRIC STRENGTH POTENTIALS			
	VOLTAGE	DURATION	VOLTAGE	DURATION
EXTRA LOW VOLTAGE TO CHASSIS	500 Vdc	1 MINUTE	0	1 SECOND
	710 Vdc		850 Vdc	

7. REFERENCE INDIVIDUAL SCHEMATICS FOR COMPONENT RATINGS.

6. DASH NUMBER OF GENERAL ASSEMBLY PROGRAM OPTION FROM SOFTWARE PROGRAM MATRIX 007323-001 IS MARKED ON ADHESIVE LABEL.

- 5. FLAMEPROOF ENCLOSURES MAINTAIN 3mm MINIMUM WALL THICKNESS.
- 4. A MINIMUM OF ONE FULL THREAD REMAINS AT THE END OF ALL THREADED BLIND HOLES.
- 3. MAXIMUM INTERNAL VOLUME.
 SENSOR ENCLOSURE: LESS THAN 500cc.
 CABLE ENCLOSURE: LESS THAN 1000cc.
- 2. MATERIAL OF CONSTRUCTION, PER METALS HANDBOOK, 8th EDITION, VOLUME 1, 1975:
 BULKHEAD & BULKHEAD ENCLOSURE:
 356-T6 OR 360 ALUMINUM WITH CHEMICAL FILM FINISH, OR
 316, (CF8-M) STAINLESS STEEL WITH ELECTRO-POLISH FINISH.
 MAXIMUM MAGNESIUM CONTENT 2%. MAXIMUM COPPER CONTENT .25%.
 COVER & RETAINER (THREADED RING):
 6061-T6, 356-T6 OR 360 ALUMINUM WITH CHEMICAL FILM FINISH, OR
 316, (CF8-M) STAINLESS STEEL WITH ELECTRO-POLISH FINISH.
 MAXIMUM MAGNESIUM CONTENT 2%. MAXIMUM COPPER CONTENT .25%.

OI REFLECTOR: 316 STAINLESS STEEL.
 WINDOW: SAPPHIRE, #2.0 X .04 THK., COATED.

LABEL: ITEM 27 - 300 SERIES STAINLESS STEEL WITH SILKSCREEN LETTERING OR LASER MARKED IMAGE.
 ITEM 35 - 300 SERIES STAINLESS STEEL WITH STAMPED LETTERING.

1. CERTIFIED PRODUCT - NO MODIFICATIONS PERMITTED WITHOUT REFERENCE TO FMA & CSA.

3. MAIN CPU FIRMWARE 007278-001, REV J (STAND/007284-001, REV A (SIL) ARE MARKED ON ADHESIVE LABEL.

12. FOR EOL RESISTORS INSTALLATION REFER TO MAIN

THIS AREA SPECIFIES THE ENCLOSURE MATERIAL:
 A - ALUMINUM
 S - STAINLESS STEEL

THIS AREA CONTAINS THE FOLLOWING ORDER SPECIFICATION (O.S.) NUMBER:
 X3301 OR X33AF a,b,c,d,e WHERE,

a= ENCLOSURE MATERIALS.

A ALUMINUM
 S STAINLESS STEEL

b= TYPE, AND NUMBER OF THREADED LOCATIONS.

4M 4 PORT, METRIC M25
 4N 4 PORT, 3/4" NPT

c= OUTPUTS

11 RELAY
 13 RELAY & 4-20mA (DEC & AUTRONICA)
 14 LON EAGLE QUANTUM PREMIER
 15 RELAY AND PULSE
 19 POWER LOOP (AUTRONICA ONLY)
 21 RELAY - AUTOMOTIVE
 23 RELAY/4-20 mA AND HART

d= APPROVAL AGENCY

A FMA & CSA
 T SIL CERTIFICATION
 W FMA/CSA/CENELEC/CE

e= CLASSIFICATION

1 STANDARD
 2 EXTENDED TEMPERATURE

CONDUIT OPENINGS MUST ENGAGE +1/2 TO +3 1/2 TURNS DEEPER THAN NOMINAL (REF ANSI/ASME B1 THREAD TYPE IS MARKED (3/4NPT OR M25).