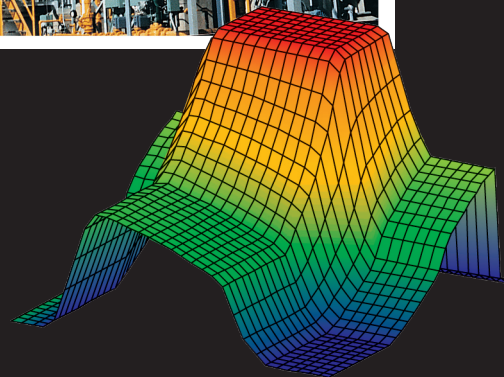


Fireeye® Flame Safeguard Controls



United Technologies

SYSTEM COMPONENTS CATALOG



FLAME SAFEGUARD CONTROLS



Systems Components Products

For over 70 years, Fireeye has manufactured quality flame safeguard and combustion controls for the industrial market. We are proud of our global reputation and worldwide market position. Dedicated to a constant process of innovation and service, we consistently provide safe and reliable products to our customers.



IMPORTANT NOTICE

Periodically, Fireeye receives inquiries from the field concerning the use of rebuilt controls. In years past, Fireeye and other manufacturers of flame safety devices did rebuild controls.

These rebuilt controls were certified by a “nationally recognized testing agency” (UL) and subject to different standards than new equipment. Essentially, all components were replaced with the exact components that were used in a new control. Only the housings and lenses (if applicable) were reused. Fireeye no longer rebuilds controls (as of 1989), nor have we authorized any other company to rebuild for us.

Currently, there are several other companies selling “rebuilt” or “reconditioned controls. **None** of these companies have an approval from any nationally recognized testing agency. What this means is the following:

1. Fireeye assumes no liability for any incident resulting from the use of a rebuilt control.
2. Your insurance coverage should be reviewed if you use rebuilt controls.
3. The use of safety controls rebuilt by any party other than the original manufacturer is in violation of ASME, CSD-1 standard.
4. Use of rebuilt controls is in violation of National Fire Protection Agency Association.

For over seventy years, Fireeye has been a leader in promoting flame safety. We are very committed to adhering to standards established by testing agencies, fire codes and insurance requirements as well as developing new scanner technology.

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For additional information visit our web site www.fireye.com

NOTICE: When Fireye products are combined with equipment manufactured by others and/or integrated into systems designed or manufactured by others, the Fireye warranty, as stated in its General Terms and Conditions of Sale, pertain only to the Fireye products and not to any other equipment or to the combined system or its overall parts.

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Table 1: InSight Integrated Scanners 95IR, 95UV, 95DS (24 VDC)

PART NUMBER	SENSOR	FIBER OPTIC MOUNT	12-PIN CONNECTOR	10 FT (3M) CABLE & GLAND	MAXIMUM CONTACT RATING	HOUSING RATING (see note)	AGENCY APPROVALS			
							UL C/US	FM	DIN-DVGW	CE
95IRS2-1	IR	NO	YES	NO	240 VAC	NEMA 4X, IP66 CLASS I DIV. 2 GROUPS A, B, C & D CLASS II DIV. 2 GROUPS F & G	YES	YES	NO	NO
95UVS2-1	UV									
95DSS2-1	IR & UV									
95IRS2-1CG	IR	NO	NO	YES	240 VAC	NEMA 4X, IP66 CLASS I DIV. 2 GROUPS A, B, C & D CLASS II DIV. 2 GROUPS F & G	YES	YES	NO	NO
95UVS2-1CG	UV									
95DSS2-1CG	IR & UV									
95IRS2E-1	IR	NO	YES	NO	50 VAC	NEMA 4X, IP66  II 3 G/D EEx nA IIC T6	NO	YES	YES	YES
95UVS2E-1	UV									
95DSS2E-1	IR & UV									
95IRS2E-1CG	IR	NO	NO	YES	240 VAC	NEMA 4X, IP66  II 3 G/D EEx nA IIC T6	YES	NO	YES	YES
95UVS2E-1CG	UV									
95DSS2E-1CG	IR & UV									
95IRS2-2	IR	YES	YES	NO	240 VAC	NEMA 4X, IP66 CLASS I DIV. 2 GROUPS A, B, C & D CLASS II DIV. 2 GROUPS F & G	YES	YES	NO	NO
95IRS2-2CG			NO	YES						
95IRS2E-2	IR	YES	YES	NO	50 VAC	NEMA 4X, IP66	NO	YES	YES	YES
95IRS2E-2CG			NO	YES	240 VAC					
95UVS2-2	UV	YES	YES	NO	240 VAC	NEMA 4X, IP66 CLASS I DIV. 2 GROUPS A, B, C & D CLASS II DIV. 2 GROUPS F & G	YES	YES	NO	NO
95UVS2-2CG			NO	YES						
95UVS2E-2	UV	YES	YES	NO	50 VAC	NEMA 4X, IP66	NO	YES	YES	YES
95UVS2E-2CG			NO	YES	240 VAC					
95IRS2-1CEX	IR	NO	NO (TWO INTERNAL 8-POLE TERMINAL BLOCKS)	NO	240 VAC	IP66 CENELEC EEx d IIC T6	NO	NO	NO (see Note)	NO
95UVS2-1CEX	UV									
95DSS2-1CEX	IR & UV									
95IRS2E-1CEX	IR	NO	NO (TWO INTERNAL 8-POLE TERMINAL BLOCKS)	NO	240 vac	IP66 CENELEC EEx d IIC T6	NO	NO	YES (see Note)	YES
95UVS2E-1CEX	UV									
95DSS2E-1CEX	IR & UV									

Note: The housing into which the Model CEX InSight electronics are installed has been approved by CENELEC and ATEX for use in EExd IIC T6 hazardous areas.

Note: Class I Division 2 Hazardous Area requirements for InSight scanners with electrical connectors (non-CG models):

1. It is necessary to either use the "C" or "RC" model cable assemblies or cable connector kits and install the cable in flexible conduit, or use the 61-6944 Wiring Harness.
2. The connector coupling nut setscrew must be tightened after mating the cable to the scanner.
3. The red warning label must be adhered to the connector housing.

Table 2: Phoenix Integrated Scanners 85UV, 85IR (24 VDC)

PART NUMBER (see note 2)	SENSOR	FIBER OPTIC MOUNT	8-PIN CONNECTOR	MAXIMUM CONTACT RATING	HOUSING RATING (see note 2)	AGENCY APPROVALS			
						UL C/US	FM	DIN-DVGW DIN-CERTCO	CE
85UVF1-1QD	UV	NO	YES	230 VAC	NEMA 4X, IP66 CLASS I DIV. 2 GROUPS A, B, C & D CLASS II DIV. 2 GROUPS F & G	YES	YES	YES	YES
85IRF1-1QD	IR								
85UVF1-2QD	UV	YES	YES	230 VAC	NEMA 4X, IP66 CLASS I DIV. 2 GROUPS A, B, C & D CLASS II DIV. 2 GROUPS F & G	YES	YES	YES	YES
85IRF1-2QD	IR								
85UVF4-1QDWR	UV	NO	YES	230 VAC	NEMA 4X, IP66 CLASS I DIV. 2 GROUPS A, B, C & D CLASS II DIV. 2 GROUPS F & G	YES	YES	NO	NO
85IRF4-1QDWR	IR								
85UVF4-2QDWR	UV	YES	YES	230 VAC	NEMA 4X, IP66 CLASS I DIV. 2 GROUPS A, B, C & D CLASS II DIV. 2 GROUPS F & G	YES	YES	NO	NO
85IRF4-2QDWR	IR								
85UVF1-1CEX	UV	NO	NO	230 VAC	IP66 ATEX: EEx d IIC T6	NO	NO	YES	YES
85IRF1-1CEX	IR								

Note 1: The housing into which the Model CEX Phoenix electronics are installed has been approved by ATEX for use in EExd IIC T6 hazardous areas.

Note 2: The “WR” models are for special applications. They are used with an E110 control and EDC1 or EDC2 amplifier, or with a MicroM control and MEDC2 amplifier. See bulletins 133-732 and 133-733.

Table 3: Series 45UV/RM/FS Scanners**(All scanners are compatible with Fireye amplifiers listed in Table 4)**

TYPE/MODEL	FREQ. Hz	WAVE- LENGTH (nanometers)	MOUNT THREADS	AMBIENT TEMP. MAX., MIN.	SAFETY APPROVALS	BULLETIN	NOTES
45UV5-1000	60	180 - 250	1" NPT	200°F (93°C) - 40°F (-40°C)	FM, APAVE	CU-22	See Notes 1 and 2
45UV5-1010	60	180 - 250	1" BSP	200°F (93°C) - 40°F (-40°C)	FM	CU-22	See Notes 1 and 2
45UV5-1101	50	180 - 250	1" BSP	200°F (93°C) - 40°F (-40°C)	FM, DIN	CU-22	See Notes 1 and 3
45RM1-1001	50/60	450 - 1,000	1" NPT	150°F (65°C) - 40°F (-40°C)	FM	CU-26	See Note 1
45RM1-1003	50/60	450 - 1,000	1" BSP	150°F (65°C) - 40°F (-40°C)	FM, DIN	CU-26	See Note 1
45RM2-1000	50/60	700 - 2,500	1" NPT	150°F (65°C) - 40°F (-40°C)	FM, APAVE	CU-26	See Note 1
45RM2-1001	50/60	700 - 2,500	1" BSP	150°F (65°C) - 40°F (-40°C)	FM, DIN	CU-26	See Note 1
45RM4-1000	24VDC	700 - 2,500	1" NPT	150°F (65°C) - 40°F (-40°C)	FM, APAVE	CU-31	—
45RM4-1001	24VDC	700 - 2,500	1" BSP	150°F (65°C) - 40°F (-40°C)	FM, DIN	CU-31	—
45FS1-1000	24VDC	700 - 2,500	1" NPT	150°F (65°C) - 4°F (-20°C)	FM	CU-32	—
45FS1-1001	24VDC	700 - 2,500	1" BSP	150°F (65°C) - 4°F (-20°C)	FM	CU-32	—
45UVFS1-1000	24VDC	290 - 390	1" NPT	131°F (55°C) - 4°F (-20°C)	FM	CU-32	—
45UVFS1-1001	24VDC	290 - 390	1" BSP	131°F (55°C) - 4°F (-20°C)	FM	CU-32	—

Note 1: 25SU3-2100 requires 19UVPS-2120 or -2220 power supply.
 Note 2: Compatible with 25SU3-4169T controls with Engineering Code 18 or higher.
 Note 3: Compatible with 25SU3-4169T controls with Engineering Code lower than 18.

Table 4: Series 45UV/RM/FS Scanners with Explosion-Proof Housings

TYPE/MODEL	FREQ. Hz	WAVE-LENGTH (nanometers)	MOUNT THREADS	AMBIENT TEMP. MAX., MIN.	NOTES
45UV5-1101CEX	50	180-250	1" BSP	200°F (93°C) - 40°F (-40°C)	45UV5-1101 mounted in ATEX approved housing. EExd IIC T6.
45UV5-1000CEX	60		1" NPT		45UV5-1000 mounted in ATEX approved housing. EExd IIC T6.
45UV5-1101EX	50		1" BSP		Class I, Div. 1 and 2, Groups C, D; Class II, Div. 1 and 2, Groups E, F, G; Class III approved housing.
45UV5-1000EX	60		1" NPT		Class I, Div. 1 and 2, Groups C, D; Class II, Div. 1 and 2, Groups E, F, G; Class III approved housing.
45RM1-1001EX	50/60	450-1,000	1" NPT	150°F (65°C) - 40°F (-40°C)	Class I, Div. 1 and 2, Groups C, D; Class II, 1 and 2, Groups E, F, G; Class III approved housing.
45RM2-1000EX	50/60	700-2,500	1" NPT		Class I, Div. 1 and 2, Groups C, D; Class II, Div. 1 and 2, Groups E, F, G; Class III approved housing.
45RM4-1000CEX	24VDC	700-2,500	1" NPT	150°F (65°C) - 40°F (-40°C)	45RM4-1000 mounted in ATEX approved housing. EExd IIC T6.
45RM4-1000EX	24VDC	700-2,500	1" NPT		Class 1, Div. 1 and 2, Groups C, D; Class II, Div. 1 and 2, Groups E, F, G; Class III approved housing.
45FS1-1000CEX	24VDC	700-2,500	1" NPT	150°F (65°C) - 4°F (-20°C)	45FS1-1000 mounted in ATEX approved housing. EExd IIC T6.
45FS1-1000EX	24VDC	700-2,500	1" NPT		Class 1, Div. 1 and 2, Groups C, D; Class II, Div. 1 and 2, Groups E, F, G; Class III approved housing.
45UVFS1-1000CEX	24VDC	290-390	1" NPT	131°F (55°C) - 4°F (-20°C)	45UVFS1-1000 mounted in ATEX approved housing. EExd IIC T6.
45UVFS1-1000EX	24VDC	290-390	1" NPT		Class 1, Div. 1 and 2, Groups C, D; Class II, Div. 1 and 2, Groups E, F, G; Class III approved housing.

Table 5: Series 25SU3, 25SU5 Amplifiers and Controls

TYPE/MODEL	SUPPLY VOLTAGE ¹	MAX. FLAME FAIL. RESPONSE TIME (FFRT)	AMBIENT TEMP. MAX., MIN.	SAFETY APPROVALS	BULLETIN	SHIPPING WEIGHT
25SU3-2100	24 VAC, 24 VDC	1 sec. to 6 sec. Selectable	140°F (60°C) - 4°F (-20°C)	FM	CU-34	1.5 lbs. (.7kg)
25SU5-5011	120 VAC	4 sec., 1 sec. Selectable	125°F (52°C) 32°F (0°C)	FM	CU-27	6 lbs. (2.7 kg)
25SU5-5012	120 VAC	4 sec., 1 sec. Selectable		FM	CU-27	6 lbs. (2.7 kg)
25SU5-5013	120 VAC	4 sec., 1 sec. Selectable		FM	CU-27	6 lbs. (2.7 kg)
25SU3-5166	120 or 230 VAC	3, 2, 1 sec. Selectable	140°F (60°C) 32°F (0°C)	DIN and APAVE	CX-742E	6 lbs. (2.7 kg)
25SU3-5168	120 VAC or 230 VAC	3, 2, 1 sec. Selectable		DIN and APAVE	CX-742E	6 lbs. (2.7 kg)
25SU3-4169T	See Note 4					
25SU3-4170	See Note 2					
25SU3-4171	See Note 3					
25SU3-4172	See Note 2					
25SU3-5172	See Note 2					
25SU3-5173	See Note 3					
<p>Note 1: Frequency 50/60 Hz for AC controllers. Note 2: No longer available. Replace with 25SU3-2100 and 192SU3-2120 Note 3: No longer available. Replace with 25SU3-2100 and 192SU3-2220. Note 4: No longer available.</p>						

InSight™ Scanners, 95IR, 95UV, 95DS

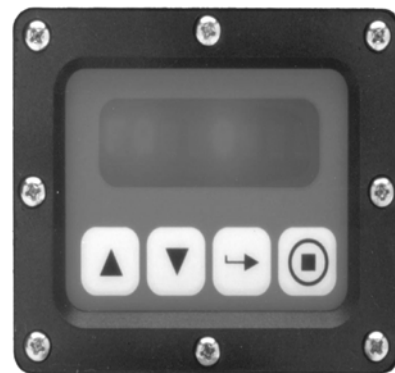
The FIREYE InSight™ Type 95IR, 95UV, and 95DS flame scanners are micro-processor based flame scanners utilizing solid state infrared (IR) or ultraviolet (UV) or dual (IR and UV) sensors.

The FIREYE InSight™ Type 95 flame scanners incorporate an internal flame relay with adjustable ON/OFF thresholds, thereby eliminating the need for a remote flame amplifier.

The InSight™ scanners incorporate elements of the FIREYE Type 45FS1 and 45UVFS1 Signature Scanners™ as well as of the Type 45RM4 flame scanners to detect the presence or absence of a target flame in single or multi-burner applications.

The InSight™ scanners measure the amplitude of the modulations (the flame “flicker”) that occur within the targeted flame. During the scanner set-up procedure, the modulation frequency that yields the best flame ON/OFF discrimination is selected. The appropriate modulation frequency and sensor gain is either manually selected or automatically selected with manual override capability (AutoTune).

The InSight™ 95IR, 95UV, and 95DSS2 scanners have twenty-one choices of modulation frequency, adjustable sensor gain, adjustable flame relay ON/OFF thresholds, 4-20 mA analog signal strength output, fault relay, and four selectable programmable files to store setpoints (for different fuels or firing rates). These scanners also have remote communications capability via Fireye® FS950W-1 Windows® based PC software.



InSight™ Scanners, 95IR,95UV, 95DS

All InSight™ scanner models are powered by 24 VDC and contain electronic self-checking (no mechanical shutter required). InSight™ scanners are available with a twelve-pin male electrical disconnect (standard), or with ten feet of captive cable and no connector (“CG” models). The scanners contain an eight character alphanumeric LED display and a four (4) push-button keypad to enable the user to view operating parameters and select setpoints.

Scanner accessories include 24 VDC power supplies, pre-fabricated cable assemblies, harness assemblies and mounting flanges. Refer to bulletins CU-95, CU-96, CU-97 and CU-100.

TYPE/MODEL	FREQ. HZ.	WAVELENGTH (nanometers)	MOUNT THREADS	AMBIENT TEMP. MAX., MIN.	SAFETY APPROVALS	NOTES
95IRS2-1	24 VDC	700-1700	1" NPT (P/N 60-2692) or 1" BSP (P/N 60-2693) mounting flange ordered separately	150° (65°C) -40°F (-40°C)	ULC/US, FM	See page 4 for complete model listing.
95IRS2E-1					DIN-DVGW, CE	
95UVS2-1		295-320			ULC/US, FM	
95UVS2E-1					DIN-DVGW, CE	
95DSS2-1		295-320 & 700-1700			ULC/US, FM	
95DSS2E-1					DIN-DVGW, CE	

Recommended Scanner Cable

59-497 12-wire shielded scanner cable.

Accessories

59-497-xxx Pre-fabricated scanner cable with female connector

59-497-xxxR Pre-fabricated scanner cable with right angle female connector

59-497-xxxC Pre-fabricated scanner cable with female connector and flexible conduit adapter

59-497-xxxRC Pre-fabricated scanner cable with right angle female connector and flexible conduit adapter

60-2692 1" NPT mounting flange kit, includes 35-127-1 insulating nipple.

60-2963 1" BST mounting flange kit, includes 35-127-3 insulating nipple.

129-164 Female cable quick-disconnect kit

129-164R Female cable quick-disconnect kit, right angle

129-164C Female cable quick-disconnect kit, with flexible conduit adapter

129-164RC Female cable quick-disconnect kit, right angle with flexible conduit adapter.

Phoenix Scanners 85UVF and IRF

The Fireye Phoenix type 85UVF/IRF flame scanners are microprocessor based devices utilizing a solid state flame detection sensor. The Phoenix flame scanners incorporate an internal flame relay with automatically set ON/OFF thresholds, thereby eliminating the need for a remote flame amplifier or flame switch.

Phoenix scanners detect the amplitude of the modulations (the flame “flicker”) that occur within the targeted flame, over a wide frequency. During the scanner setup procedure, the amplitudes of the target flame are automatically stored by the flame scanner, together with optimum ON/OFF criteria. The appropriate sensor gain is automatically selected. Phoenix scanners incorporate full self diagnostics and electronic self checking.



The Phoenix 85UVF/IRF is available in multiple models differentiated by detection cell type, levels of hazardous area certifications and agency approvals.

The Phoenix 85UVF/IRF flame scanner is powered by 24Vdc. Electrical connection is via an 8-pin electrical quick-disconnect (QD). An analog 4 to 20mA output of flame strength is standard.

Operator interface to the Phoenix scanner is via a pushbutton keypad and informative LEDs. These provide continuous indication of flame signal, flame relay status, scanner status as well as selected mode of operation. Simplified keystroke routines are used for setup and this can be completed in seconds. For remote interface, outputs are provided for flame switch, fault relay and 4 to 20mA flame strength.

Note: The Phoenix QD models with electrical quick-disconnect have replaced the original models equipped with ten feet of captive cable. The QD models (with 59-546-x cables) are suitable for use in Class I Division 2 hazardous areas, thereby eliminating the need for "EX" models. The "CEX" models remain unchanged for use in EEx d IIC T6 hazardous areas.

Refer to bulletins CU-114 and CU-115.

TYPE/MODEL	FREQ. HZ.	WAVELENGTH (nanometers)	MOUNTING FLANGE	AMBIENT TEMP. MAX., MIN.	SAFETY APPROVALS	NOTES
85IRF1-1QD	24 VDC	700-1700	1" NPT	150 (65 C) -40 F (-40 C)	UL C/US, FM, DIN, CE	See page 5 for complete model listing.
85IRF4-1QDWR			(P/N 35-318-1) or		UL C/US, FM	
85UVF1-1QD		295-320	1" BSP		UL C/US, FM, DIN, CE	
85UVF4-1QDWR		(P/N 35-318-2) ordered separately	UL C/US, FM			

Signature Scanner™ **Type 45FSI and 45UVFSI**

The Fireye Type 45FS1 (Infrared), Type 45UVFS1 (Ultraviolet) Flame *Signature Scanner* incorporates an innovative flame detection method to determine the presence or absence of a target flame in a single or multi-burner environment. Both scanners use a software algorithm that constantly compares the real-time amplitude-frequency characteristics of the target flame with the amplitude-frequency characteristics that it learned during setup, called the *signature* of the target flame. The 45FS1/45UVFS1 scanners have an eight (8) character LED display and three (3) push-button keypad to program or review various system setpoints and operating parameters. The 45FS1/45UVFS1 flame scanners can communicate remotely both to review and to program the system setpoints as well as download and upload the “learned” flame signature data from one scanner to another. This is accomplished with an IBM compatible PC and the FS700W-1 (Windows®) software program. Fiber optic versions and explosion proof housing versions are available.

Refer to Bulletins CU-32, CU-33, CU-39 and CU-40.



Signature Scanner™ Type 45FSI and 45UVFSI

TYPE/MODEL	SUPPLY VOLTAGE	WAVELENGTH (nanometers)	MOUNT THREADS	AMBIENT TEMP. MAX., MIN.	SAFETY APPROVALS	NOTES
45FS1-1000	24VDC	700-2,500	1" NPT	150°F (65°C)	FM	Compatible with all Fireye amplifiers listed in Table 2.
45FS1-1001			1" BSP	-4°F (-20°C)		
45UVFS1-1000		290-390	1" NPT	131°F (55°C)		
45UVFS1-1001			1" BSP	-4°F (-20°C)		
SCANNERS WITH EXPLOSION-PROOF HOUSINGS						
45FS1-1000CEX	24 VDC	700-2,500	1" NPT	150°F (65°C)	FM	45FS1-1000 mounted in ATEX approved housing. EExd IIC T6
45FS1-1000EX				-4°F (-20°C)		Class I, Div 1 and 2, Groups C, D; Class II, Div 1 and 2, Groups E, F, G; Class III approved housing.
45UVFS1-1000CEX		290-390		131°F (55°C)		45UVFS1-1000 mounted in ATEX approved housing. EExd IIC T6
45UVFS1-1000EX				-4°F (-20°C)		Class I, Div 1 and 2, Groups C, D; Class II, Div 1 and 2, Groups E, F, G; Class III approved housing.
FIBER OPTIC SCANNER						
61-6625 (45FS1)	24VDC	700-2,500	Fiber Optic	150°F (65°C)	FM	Use with glass fiber optic assemblies.
61-6694-1 (45UVFS1)		290-390		-4°F (-20°C)		
				-4°F (-20°C)		

Replacement Parts

61-2275-3

Glass lens assembly for 45FS1.

61-2275-4

Quartz lens assembly for 45UVFS1.

129-127-6

Female quick-disconnect kit, includes 1/2" flexible conduit adapter.

Recommended Scanner Cable

59-470

6-wire shielded scanner cable.

59-471

8-wire shielded scanner cable. (For remote communication.)

Accessories

61-6671-10

10 foot Wiring Harness (See bulletin CU-40).

61-6671-15

15 foot Wiring Harness (See bulletin CU-40).

61-6671-20

20 foot Wiring Harness (See bulletin CU-40).

61-6671-30

30 foot Wiring Harness (See bulletin CU-40).

61-6702

Adapter kit to mount 61-6625 or 61-6694 fiber optic scanner onto Detector Electronics fiber optic assemblies (consult factory).

EC485

RS485/RS232 Adapter with 120 VAC Power supply

IC485

RS485/RS232 Optically isolated adapter with 120 VAC power supply

UC485

USB to RS-485 Optically isolated adapter (USB powered)

FS700W-1

Windows® communication software for IBM compatible PC. Allows PC to communicate with up to 128 45FS1/45UVFS1. See bulletin CU-56.

Background Gain Control (BGC) Infrared Flame Scanners Type 45RM4

The self-checking 45RM4 infra-red Flame Scanner incorporates several design features making it applicable to detect and discriminate the presence or absence of flame for a wide range of fuel types. A 16 position frequency selector switch allows the user to choose the proper frequency where the greatest discrimination occurs. A gain adjustment potentiometer on the scanner allows the user to adjust the amplification of the flame signal by the scanner. The user can also enable or disable the background gain control function via a selector switch. Ten (10) flame LEDs aid in the sighting and location of the scanner. The scanner also incorporates a quick disconnect to provide for ease of installation and removal of the scanner, as well as 24 VDC operation to reduce electrical noise interference. Fiber optic version and explosion proof housing versions available.



Refer to Bulletin CU-31.

TYPE/MODEL	SUPPLY VOLTAGE	WAVELENGTH (nanometers)	MOUNT THREADS	AMBIENT TEMP. MAX., MIN.	SAFETY APPROVALS	NOTES
45RM4-1000	24 VDC	700-2,500	1" NPT	150°F (65°C) -40°F (-40°C)	FM, APAVE	Compatible with all Fireye amplifiers listed in Table 2.
45RM4-1001			1" BSP		FM, DIN	
SCANNERS WITH EXPLOSION-PROOF HOUSINGS						
45RM4-1000CEX	24 VDC	700-2,500	1" NPT	150°F (65°C) -40°F (-40°C)	—	45RM4-1000 mounted in ATEX approved housing. EExd IIC T6.
45RM4-1000EX	24 VDC	700-2,500	1" NPT	150°F (65°C) -40°F (-40°C)	—	Class I, Div 1 and 2, Groups C, D; Class II, Div 1 and 2, Groups E, F, G; Class III approved housing
FIBER OPTIC SCANNER						
61-6521	24VDC	700-2,500	Fiber Optic Mounting	150°F (65°C) -40°F (-40°C)	—	For use with glass or quartz fiber optic assemblies.

Replacement Parts

61-2275-3

129-127-6

Glass lens assembly

Female quick-disconnect kit, includes 1/2" flexible conduit adapter.

Recommended Scanner Cable

59-470

6-Wire shielded scanner cable.

Background Gain Control (BGC) Infrared Flame Scanners Type 45RM2

The self-checking 45RM2 Flame Scanner incorporates design features uniquely suited to detecting individual flames and discriminating between flame envelopes. They are similar to the Type 45RM1 scanners but operate further into the infrared region with a much broader spectral response. Flames monitored by the 45RM2 may be those of pulverized coal, oil, natural gas, and flames of other sources of methane, propane, butane, and other gases. Fiber optic version and explosion proof housing versions available.



Refer to Bulletin CU-26.

TYPE/MODEL	FREQ. HZ.	WAVELENGTH (nanometers)	MOUNT THREADS	AMBIENT TEMP. MAX., MIN.	SAFETY APPROVALS	NOTES
45RM2-1000	50/60	700-2,500	1" NPT	150°F (65°C) -40°F (-40°C)	FM, APAVE	—
45RM2-1001			1" BSP		FM, DIN	
SCANNERS WITH EXPLOSION-PROOF HOUSINGS						
45RM2-1000EX	50/60	700-2,500	1" NPT	150°F (65°C) -40°F (-40°C)	—	Class I, Div. 1 and 2, Groups C, D; Class II, Div. 1 and 2, Groups E, F, G; Class III approved housing.
FIBER OPTIC SCANNERS						
61-5234	50/60	700-2,500	Fiber Optic Mounting	150°F (65°C) -40°F (-40°C)	—	For use with glass or quartz fiber optic assemblies.
All controls in this table are compatible with all Fireeye amplifiers listed in Table 2. When these scanners are used with 25SU3-2100, a 19UVPS-2120 or -2220, or 19MPS-2000 power supply is required.						

Replacement Parts

61-4468-1	Shutter and bracket assembly
61-2275-3	Glass lens assembly
60-1622	Long Range Lens Assembly (for use when scanner is greater than 12 feet from flame, e.g. kiln applications).
60-2366	Quick disconnect kit, includes 1/2" flexible conduit adapter. Includes both male and female connectors.

Recommended Scanner Cable

59-470	6-Wire shielded scanner cable.
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Background Gain Control (BGC) Infrared Flame Scanners Type 45RM1

The self-checking 45RM1 Flame Scanner incorporates a number of unique features to provide excellent flame detection and discrimination when firing pulverized coal, oil or other fuels which radiate visible light during the combustion process. Outstanding operation is achieved by combining a background gain control amplifier, adjustable gain control potentiometer, and threshold detector to yield a unit which automatically adapts its sensitivity to the firing conditions and provides a clear indication of flame presence or absence in spite of surrounding radiation sources. Fiber optic version and explosion proof housing versions available.



Refer to Bulletin CU-26.

TYPE/MODEL	FREQ. Hz	WAVELENGTH (nanometers)	MOUNT THREADS	AMBIENT TEMP. MAX., MIN.	SAFETY APPROVALS	NOTES (see below also)
45RM1-1001	50/60	450-1,000	1" NPT	150°F (65°C) - 40°F (-40°C)	FM	
45RM1-1003			1" BSP		FM, DIN	
SCANNERS WITH EXPLOSION-PROOF HOUSINGS						
45RM1-1001EX	50/60	450-1,000	1" NPT	150°F (65°C) - 40°F (-40°C)	—	Class I, Div. 1 and 2, Groups C, D; Class II, 1 and 2, Groups E, F, G; Class III approved housing.
FIBER OPTIC SCANNER						
61-4892-2	50/60	450-1000	Fiber Optic Mounting	150°F (65°C) - 40°F (-40°C)	—	Use with glass IR Fiber Optic assemblies.
All Models in this table are compatible with all Fireye amplifiers listed in Table 2. When these scanners are used with 25SU3-2100, a 19UVPS-2120 or -2220, or 19MPS-2000 power supply is required.						

Replacement Parts

61-4468-1	Shutter and bracket assembly
61-2275-3	Glass lens assembly
60-1622	Long range lens assembly (for use when scanner is greater than 12 feet from flame, e.g. kiln applications).
60-2366	Quick disconnect kit, includes 1/2" flexible conduit adapter. Includes both male and female connectors.

Recommended Scanner Cable

59-470	6-Wire shielded scanner cable.
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Ultraviolet Flame Scanners Type 45UV5

The 45UV5 Scanner detects the presence of flames which emit ultraviolet radiation (UV). Typical fossil fuels which emit UV include natural gas, coke oven gas, propane, methane, kerosene, light petroleum distillates and diesel fuels. These scanners incorporate a built-in self-checking mechanism to protect against UV tube malfunctions. The scanners are available with explosion proof housings.

Refer to Bulletin CU-22.



TYPE/MODEL	FREQ. Hz	WAVELENGTH (Nanometers)	MOUNT THREADS	AMBIENT TEMP. MAX., MIN.	SAFETY APPROVALS	NOTES
45UV5-1000	60	180-250	1" NPT	200°F (93°C)	FM, APAVE	Compatible with 25SU3-4169T controls with Engineering Code 18 or higher
45UV5-1010	60		1" BSP		FM	
45UV5-1101	50		1" BSP	- 40°F (-40°C)	FM, DIN	Compatible with 25SU3-4169T controls with Engineering Code lower than 18.
SCANNERS WITH EXPLOSION-PROOF HOUSINGS						
45UV5-1101CEX	50	180-250	1" BSP	200°F (93°C)	—	45UV5-1101 mounted in ATEX approved housing. EExd IIC T6.
45UV5-1000CEX	60		1" NPT		—	45UV5-1000 mounted in ATEX approved housing. EExd IIC T6.
45UV5-1101EX	50		1" BSP	- 40°F (-40°C)	—	Class I, Div. 1 and 2, Groups C, D; Class II, Div. 1 and 2, Groups E, F, G; Class III approved housing.
45UV5-1000EX	60		1" NPT	—	—	Class I, Div. 1 and 2, Groups C, D; Class II, Div. 1 and 2, Groups E, F, G; Class III approved housing.
All Models in this table are compatible with all Fireye amplifiers listed in Table 5. When these scanners are used with 25SU3-2100, a 19UVPS-2120 or -2220, or 19MPS-2000 power supply is required.						

Replacement Parts

4-290-2	UV tube (for scanner Engineering codes 04 and higher)
61-2275-2	Quartz lens assembly
61-2841-1	NPT hinged flange
61-2841-2	BSP hinged flange
61-2913-1	Shutter, bracket, and lens assembly (for scanner Engineering codes 00 through 03)
61-7203	Shutter, bracket, and lens assembly (for scanner Engineering codes 04 and higher).
61-2914-1	Shutter and bracket assembly
60-2366	Quick disconnect kit, includes 1/2" flexible conduit adapter. Includes both male and female connectors.

Recommended Scanner Cable

59-470	6-Wire shielded scanner cable.
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Fiber Optic Scanners and Fiber Optic Sub-Assemblies

Fireye offers fiber optic versions of the 45RM1, 45RM2, 45RM4, 45FS1, 45UVFS1, 85IR, 85UV, 95IR and 95UV scanners. They have been designed for applications where liquid and solid fuel burners have movable vanes, air compartments or burner nozzles that would, in some positions, obscure a line of sight or move the flame pattern out of the field of view of a surface mounted scanner.



Specifications

MOUNTING	TEMPERATURE	PURGE AIR	LENS
Optics mounted in outer carrier tube with a 303 stainless steel hexagonal mounting head, 1 1/2" (38.1mm) across flats, which is tack welded to an air compartment nozzle parallel to the fuel flow.	ELECTRONICS: Models 45RM1, 45RM2, 45RM4: -40° F (-40° C) min., 150° F (65° C) max. Model 45FS1: -4° F (-20° C) min., 150° F (65° C) max. Model 45UVFS1: -4° F (-20° C) min., 131° F (55° C) max. FIBER OPTICS: 800° F (427° C) max. glass, 752° F (400° C) max. quartz.	4-15 SCFM (113-425 L/M) at either the 1" NPT or 3/8" NPT tap. Minimum applied pressure should be either 15" w.c. above firebox pressure at 1" NPT tap or 25" w.c. above furnace pressure at 3/8" tap..	High temperature glass or quartz.

Fiber optic scanners consist of three sub-assemblies: Scanner Electronics Assembly, Inner Carrier Assembly (includes the "A," "B," and "C" lens and fiber optic bundle either glass or quartz), and Outer Carrier Assembly. Order by specifying the part number for each sub-assembly. See the appropriate tables on the following pages.

Example: A customer wants a 9 foot quartz fiber optic assembly using a 95UVS2 type scanner. They must order the following three parts:

1. **61-7080-9** Inner Carrier Assembly, 9 ft., with quartz optics.
2. **61-5386** Outer Carrier Assembly, 9 ft.
3. **95UVS2-2** Scanner Type 95UVS2

Fiber Optic Sub-Assemblies, 45 - Series Scanners

SCANNER ELECTRONICS TYPE	PART NUMBER	BULLETIN
45RM1 (VIS/IR)	61-4892-2	CU-26, CU-21
45RM2 (IR)	61-5234	CU-26, CU-21
45RM4 (IR)	61-6521	CU-31, CU-21
45FS1 (IR)	61-6625	CU-32, CU-21
45UVFS1 (UV)	61-6694-1	CU-32, CU-21

OUTER CARRIER ASSEMBLY (USE WITH GLASS OR QUARTZ)		(GLASS) INNER CARRIER ASSEMBLY	(QUARTZ) INNER CARRIER ASSEMBLY
NOMINAL LENGTH* feet (meters)	PART NUMBER	PART NUMBER**	PART NUMBER**
3 (0.9)	61-6647	61-4894-7	61-6856-3
5 (1.5)	61-5430	61-4894-3	61-6856-5
6 (1.8)	61-6845	61-4894-8	61-6856-6
7 (2.1)	61-4893	61-4894-1	61-6856-7
9 (2.7)	61-5386	61-4894-2	61-6856-9
10 (3.0)	61-6305	61-4894-4	61-6856-10
12 (3.7)	61-6306	61-4894-5	61-6856-12
14 (4.3)	61-6540	61-4894-6	61-6856-14

REPLACEMENT PARTS		
FIBER OPTIC BUNDLE	GLASS BUNDLE	QUARTZ BUNDLE
NOMINAL LENGTH * feet (meters)	PART NUMBER**	PART NUMBER**
3 (0.9)	61-4842-7	61-6872-3
5 (1.5)	61-4842-3	61-6872-5
6 (1.8)	61-4842-9	61-6872-6
7 (2.1)	61-4842-1	61-6872-7
9 (2.7)	61-4842-2	61-6872-9
10 (3.0)	61-4842-4	61-6872-10
12 (3.7)	61-4842-5	61-6872-12
14 (4.3)	61-4842-6	61-6872-14
LENS HOLDER	GLASS LENS	QUARTZ LENS
LENS SKEW	PART NUMBER	PART NUMBER
0 deg. skew	61-4895 ("A")	61-6754 ("AA")
5 deg. skew	61-4913 ("B")	61-6864 ("AB")
9 deg. skew	61-4914 ("C")	61-6865 ("AC")

**Note: The "Nominal Length" refers to the approximate length of the overall assembly, including the installed electronics. Refer to dimensions "A" through "F" in bulletin CU-21 to determine the nominal length that best suits your application.*

***Glass optics are recommended for 45RM1, 45RM2, 45RM4 and 45FS1.*

***Quartz optics are required for 45UVFS1 are also suitable for for 45RM2, 45RM4 and 45FS1 for increased signal strength.*

Fiber Optic Sub-Assemblies, 85 - Series Phoenix Scanners

SCANNER ELECTRONICS TYPE	PART NUMBER	BULLETIN
Phoenix (IR)	85IRF1-2QD	CU-114, CU-115
Phoenix (UV)	85UVF1-2QD	CU-114, CU-115
Phoenix (IR), Special applications (For use with EDC1, EDC2, or MEDC2 direct-coupled amplifiers).	85IRF4-2QDWR	CU-114, CU-115, 133-732, 133-733
Phoenix (UV), Special applications (For use with EDC1, EDC2, or MEDC2 direct-coupled amplifiers).	85UVF4-2QDWR	CU-114, CU-115, 133-732, 133-733

OUTER CARRIER ASSEMBLY (USE WITH GLASS OR QUARTZ)		(GLASS) INNER CARRIER ASSEMBLY	(QUARTZ) INNER CARRIER ASSEMBLY
NOMINAL LENGTH* feet (meters)	PART NUMBER	PART NUMBER**	PART NUMBER**
3 (0.9)	61-6647	61-7065-3	61-7064-3
5 (1.5)	61-5430	61-7065-5	61-7064-5
6 (1.8)	61-6845	61-7065-6	61-7064-6
7 (2.1)	61-4893	61-7065-7	61-7064-7
9 (2.7)	61-5386	61-7065-9	61-7064-9
10 (3.0)	61-6305	61-7065-10	61-7064-10
12 (3.7)	61-6306	61-7065-12	61-7064-12
14 (4.3)	61-6540	61-7065-14	61-7064-14

REPLACEMENT PARTS		
FIBER OPTIC BUNDLE	GLASS BUNDLE	QUARTZ BUNDLE
NOMINAL LENGTH * feet (meters)	PART NUMBER**	PART NUMBER**
3 (0.9)	61-4842-7	61-6872-3
5 (1.5)	61-4842-3	61-6872-5
6 (1.8)	61-4842-9	61-6872-6
7 (2.1)	61-4842-1	61-6872-7
9 (2.7)	61-4842-2	61-6872-9
10 (3.0)	61-4842-4	61-6872-10
12 (3.7)	61-4842-5	61-6872-12
14 (4.3)	61-4842-6	61-6872-14
LENS HOLDER	GLASS LENS	QUARTZ LENS
LENS SKEW	PART NUMBER	PART NUMBER
0 deg. skew	61-4895 ("A")	61-6754 ("AA")
5 deg. skew	61-4913 ("B")	61-6864 ("AB")
9 deg. skew	61-4914 ("C")	61-6865 ("AC")

***Note:** The "Nominal Length" refers to the approximate length of the overall assembly, including the installed electronics. Refer to dimensions "A" through "F" in bulletin CU-115 to determine the nominal length that best suits your application.

**Glass optics are recommended for 85IR.

**Quartz optics are required for 85UV.

Fiber Optic Sub-Assemblies, 95 - Series InSight Scanners

SCANNER ELECTRONICS TYPE	PART NUMBER	BULLETIN
InSight (IR)	95IRS2-2	CU-95, CU-101
InSight (IR)	95IRS2-2CG	CU-95, CU-101
InSight (UV)	95UVS2-2	CU-95, CU-101
InSight (UV)	95UVS2-2CG	CU-95, CU-101
InSight (IR), CE	95IRS2E-2	CU-95, CU-101
InSight (IR), CE	95IRS2E-2CG	CU-95, CU-101
InSight (UV), CE	95UVS2E-2	CU-95, CU-101
InSight (UV), CE	95UVS2E-2CG	CU-95, CU-101

OUTER CARRIER ASSEMBLY (USE WITH GLASS OR QUARTZ)		(GLASS) INNER CARRIER ASSEMBLY	(QUARTZ) INNER CARRIER ASSEMBLY
NOMINAL LENGTH* feet (meters)	PART NUMBER	PART NUMBER**	PART NUMBER**
3 (0.9)	61-6647	61-6960-3	61-7080-3
5 (1.5)	61-5430	61-6960-5	61-7080-5
6 (1.8)	61-6845	61-6960-6	61-7080-6
7 (2.1)	61-4893	61-6960-7	61-7080-7
9 (2.7)	61-5386	61-6960-9	61-7080-9
10 (3.0)	61-6305	61-6960-10	61-7080-10
12 (3.7)	61-6306	61-6960-12	61-7080-12
14 (4.3)	61-6540	61-6960-14	61-7080-14

REPLACEMENT PARTS		
FIBER OPTIC BUNDLE	GLASS BUNDLE	QUARTZ BUNDLE
NOMINAL LENGTH * feet (meters)	PART NUMBER**	PART NUMBER**
3 (0.9)	61-4842-7	61-6872-3
5 (1.5)	61-4842-3	61-6872-5
6 (1.8)	61-4842-9	61-6872-6
7 (2.1)	61-4842-1	61-6872-7
9 (2.7)	61-4842-2	61-6872-9
10 (3.0)	61-4842-4	61-6872-10
12 (3.7)	61-4842-5	61-6872-12
14 (4.3)	61-4842-6	61-6872-14
LENS HOLDER	GLASS LENS	QUARTZ LENS
LENS SKEW	PART NUMBER	PART NUMBER
0 deg. skew	61-4895 ("A")	61-6754 ("AA")
5 deg. skew	61-4913 ("B")	61-6864 ("AB")
9 deg. skew	61-4914 ("C")	61-6865 ("AC")

**Note: The "Nominal Length" refers to the approximate length of the overall assembly, including the installed electronics. Refer to dimensions "A" through "F" in bulletin CU-101 to determine the nominal length that best suits your application.*

***Glass optics are recommended for 95IR.*

***Quartz optics are required for 95UV.*

Flame Scanner Accessories

PART NUMBER	DESCRIPTION
4-290-2	UV tube for 45UV5 scanners, Engineering code 04 and higher only.
16-103	Lens retainer for all scanners (orange bushing).
34-181	Retaining Ring for orifice (53-121)
35-127-1	Heat insulating Nipple (1" NPT threads)
35-127-3	Heat insulating Nipple (1" BSP threads)
35-200	1" "Y" connector (NPT)
35-201	1" Close Nipple (NPT)
35-202	3/8" Plug (NPT)
35-240	1 inch close nipple (BSP)
46-4	Lens for long range lens assembly 60-1622.
46-38	Quartz lens for 45UV5 scanner.
46-87	Lens for 45RM1, 45RM2, 45RM4, and 45FS1 scanners
46-179	Quartz lens for 45UVFS1 scanner.
53-121	#2 through 10 orifice plate set for all scanners, includes 34-181 retaining ring.
60-1199-1	Sealing coupling with quartz window (1" NPT)
60-1199-2	Sealing coupling with quartz window (1" BSP)
60-1622	Long range lens assembly for 45RM1, 45RM2, 45RM4, 45FS1 scanners
60-1664-3	Swivel mount (NPT threads)
60-1664-4	Swivel mount (BSP threads)
60-2366	Quick-disconnect kit for 45UV5, 45RM1, 45RM2 (male and female connectors).
61-2275-2	Quartz lens assembly for 45UV5.
61-2275-3	Glass lens assembly for 45RM1, 45RM2, 45RM4, 45FS1.
61-2275-4	Quartz lens assembly for 45UVFS1.
61-2841-1	NPT hinged flange for 45UV5.
61-2841-2	BSP hinged flange for 45UV5.
61-2913-1	Shutter, gasket, bracket, and lens assembly for 45UV5 (includes 61-2914-1).Engineering codes 00 thru 03 only.
61-7203	Shutter, gasket, bracket, and lens assembly for 45UV5 (includes 61-2914-1) for Engineering code 04 and higher only.
61-2914-1	Shutter and bracket assembly only for 45UV5.
61-4468	Shutter and bracket assembly for 45RM1, 45RM2.
82-95	Lens Holder for all scanners (orange grommet).
92-48	Quartz Window for P.N. 60-1199.
101-78	Diode (use when combining 45UV5 with 45RM scanners).
129-127-6	Female quick-disconnect kit (with 1/2 inch flexible conduit adapter) for 45RM4, 45FS1, 45UVFS1 scanners.

Flame Scanner Cables

PART NUMBER	DESCRIPTION
59-470	6-wire with special shield around all wires. For use with all scanners. Specify length. Cable shipping weight: 12 lbs./100 ft. 4.5 kg/25m.
59-471	8-wire with special shield around all wires. For use with 45FS1 and remote communications. Specify length. Cable shipping weight: 12 lbs / 100 ft. 4.5 kg/ 25m.
59-470-XXX	59-470 cable pre-wired with the female quick disconnect for use with 45RM4, 45FS1, 45UVFS1 scanners. Available in varying lengths up to 200 feet.
59-471-XXX	59-471 cable pre-wired with the female quick disconnect for use with 45RM4, 45FS1, 45UVFS1 scanners. Available in varying lengths up to 200 feet.
60-6671-X	Wiring harness for 45FS1/45UVFS1 scanners. Includes junction box and 59-471 cable in flexible conduit. Available in lengths up to 40 feet.
59-497	12 conductor cable for InSight and Phoenix scanners
59-497-xxx	59-497 cable, pre-wired with straight female quick-disconnect for use with InSight scanners (non "CG" models). Available in varying lengths up to 300 feet.
59-497-xxxR	59-497 cable, pre-wired with right-angle female quick-disconnect for use with InSight scanners (non "CG" models). Available in varying lengths up to 300 feet.
59-497-xxxC	59-497 cable, pre-wired with straight female quick-disconnect and flexible conduit adapter for use with InSight scanners (non "CG" models). Available in varying lengths up to 300 feet.
59-497-xxxxRC	59-497 cable, pre-wired with right-angle female quick-disconnect and flexible conduit adapter for use with InSight scanners (non "CG" models). Available in varying lengths up to 300 feet.
59-497-020-WR	59-497 cable, pre-wired with straight female quick-disconnect. For use with InSight scanners (non "CG" models) and direct-coupled amplifiers only (EDC1, EDC2, MEDC2). Available in 20-foot length only.
59-497-020R-WR	59-497 cable, pre-wired with right-angle female quick-disconnect. For use with InSight scanners (non "CG" models) and direct-coupled amplifiers only (EDC1, EDC2, MEDC2). Available in 20-foot length only.
59-497-020C-WR	59-497 cable, pre-wired with straight female quick-disconnect and flexible conduit adapter. For use with InSight scanners (non "CG" models) and direct-coupled amplifiers only (EDC1, EDC2, MEDC2). Available in 20-foot length only.
59-497-020RC-WR	59-497 cable, pre-wired with right-angle female quick disconnect and flexible conduit adapter. For use with InSight scanners (non "CG" models) and direct-coupled amplifiers only (EDC1, EDC2, MEDC2). Available in 20-foot length only.
60-2771	Junction box with twelve terminals for Simplicity, Phoenix, and InSight scanners
61-6944-xxx	Wiring harness for InSight scanners (non "CG" models). Includes junction box and 59-497 cable in flexible conduit, with straight female quick-disconnect. Available in various lengths up to 50 feet.
61-6944-xxxR	Wiring harness for InSight scanners (non "CG" models). Includes junction box and 59-497 cable in flexible conduit, with right-angle female quick-disconnect. Available in various lengths up to 50 feet.

Control Type 25SU5 Model 5011, 5012, 5013, Control Type 25SU3 Model 5166, 5168

Fireye Type 25SU5 Model 5011, 5012, 5013 and Type 25SU3 Model 5166, 5168 Controls are surface mounted controls used in conjunction with Type 45UV5, 45RM, 45FS, 45UVFS Flame Scanners. These controls and scanners comprise a repetitive self-checking system that confirms flame presence and absence to provide reliable ignition and flame failure protection. When combined with appropriate auxiliary devices, these controls enable construction of integrated safety interlock systems for single and multiple industrial burner applications firing gas, oil, pulverized coal, or a combination of fuels continuously. The 5011, 5012, 5013, 5166, and 5168 Controls may also be installed in the safety control circuits of supervised manual, semi-automatic, and fully automatic burner management systems as the primary safety control. Wiring Base required: P/N 60-2206-1 (5011, -5012, -5013), P/N 6-2206-2 (5166, -5168).

These flame safeguard controls monitor flame to supervise burner and pilot performance throughout the entire burner load range. Features include Flame Relay, Master Relay (Type 25SU5 only), 0-3 VDC Output, 2 scanner operation.

Optional Display Module, P/N 60-2205: Includes Bar Graph Display, Marginal Alarm with LED, Flame Relay LED, and 0-20mA DC output.



SHOWN WITH OPTIONAL 60-2205 DISPLAY MODULE

CONTROL	CHASSIS	AMPLIFIER	WIRING BASE (Ordered Separately)	SENSITIVITY
25SU5-5011	60-2204-2	60-2207-1	60-2206-1	High Sensitivity
25SU5-5012	60-2204-2	60-2207-2	60-2206-1	High Discrimination
25SU5-5013	60-2204-2	60-2207-3	60-2206-1	High Sensitivity/ Low Hysteresis
25SU3-5166	60-2203-2	60-2207-2	60-2206-2	High Discrimination
25SU3-5168	60-2203-2	60-2207-1	60-2206-2	High Sensitivity
All controls include a dust cover (60-2223), blank display module (60-2301) and mounting screw (48-1805)				

Note: Flame Amplifier Modules 60-2207-1, -2, -3 are operative in either of the chassis. The 60-2207-1 is a high sensitivity (flame amplification characteristics) amplifier for use on single burner applications with little or no background radiation. The 60-2207-2 is a high discrimination amplifier for use on single or multi-burner applications where background radiation is present (e.g. adjacent flame tips, hot refractory, etc.). The 60-2207-3 has the sensitivity of the 60-2207-1 but without the flame relay on:off hysteresis. This is suitable for applications where there is a very small difference between flame on and flame off signal strength.

Control Type 25SU5 Model 5011, 5012, 5013, Control Type 25SU3 Model 5166, 5168

TYPE/MODEL	SUPPLY VOLTAGE 50/60 Hz	MAXIMUM FLAME FAILURE RESPONSE TIME (FFRT)	NOMINAL SHUTTER TOTAL CYCLE PERIOD	AMBIENT TEMP. MAX., MIN.	SAFETY APPROVALS	BULLETIN	SHIPPING WEIGHT
25SU5-5011	120 VAC	1 sec., 4 sec. Selectable	0.50/4.5	125°F (52°C) 32°F (0°C)	FM	CU-27	6 lbs. (2.7 kg)
25SU5-5012	120 VAC	1 sec., 4 sec. Selectable	0.50/4.5	125°F (52°C) 32°F (0°C)	FM	CU-27	6 lbs. (2.7 kg)
25SU5-5013	120 VAC	1 sec., 4 sec. Selectable	0.50/4.5	125°F (52°C) 32°F (0°C)	FM	CU-27	6 lbs. (2.7 kg)
25SU3-5166	120 or 230 VAC	3, 2, 1 sec. Selectable	0.50/4.5	140°F (60°C) 32°F (0°C)	DIN and APAVE	CX-742E	6 lbs. (2.7 kg)
25SU3-5168	120 or 230 VAC	3, 2, 1 sec. Selectable	0.50/4.5	140°F (60°C) 32°F (0°C)	DIN and APAVE	CX-742E	6 lbs. (2.7 kg)

Type 25SU5 and 25SU3 Control Parts and Accessories

PART NUMBER	DESCRIPTION	BULLETIN NUMBER
48-1805	Mounting Screw for 5011/5166	CU-27, CX-742E
60-2203-2	5166, 5168 Chassis	CX-742E
60-2204-2	5011, 5012, 5013 Chassis	CU-27
60-2205	Display Module	CU-27, CX-742E
60-2206-1	5011, 5012, 5013 Wiring Base	CU-27
60-2206-2	5166, 5168 Wiring Base	CX-742E
60-2207-1	5011, 5168 Flame Amplifier Module (High Sensitivity)	CU-27, CX-742E
60-2207-2	5012, 5166 Flame Amplifier Module (High Discrimination)	CU-27, CX-742E
60-2207-3	5013 Flame Amplifier Module (High Sensitivity/ Low Hysteresis)	CU-27
60-2223	Dust Cover	CU-27, CX-742E
60-2301	Blank Display Module	CU-27, CX-742E
60-2367	Ribbon cable for 5011, 5012, 5013, 5166, 5168.	CU-27, CX-742E

Flame Amplifier 25SU3 Model 2100

The Fireeye Type 25SU3-2100 is a rack-mounted flame amplifier used in conjunction with Type 45UV5¹, 45RM1, 45FS, 45UVFS, C9701 and C9707 scanners. The amplifier and scanners comprise a repetitive self-checking system that confirms the presence or absence of flame to provide reliable ignition and flame protection.



Refer to Bulletin CU-34.

Approvals: FM

The 25SU3-2100 incorporates the following design features to help maximize burner discrimination:

- 4-key keypad, 8 character alpha-numeric display, and 4 LED indicator lights to review and program operating parameters and system setpoints.
- Ability to display the flame signal pulses from the flame scanner(s).
- The flame signal from the flame scanners can be processed separately or combined in a number of logical configurations (e.g. AND, OR, etc.).
- Ability to program the pull-in and drop-out thresholds for the flame relay (DPDT) based on actual flame signal pulses.
- Programmable marginal alarm relay (SPDT).
- Password protection to prevent unauthorized alteration of operating setpoints.

The 25SU3-2100 is based on the standard Euro-Card rack-mounted format, operating on either 24VAC or 24VDC.

1. 45UV5, 45RM1, and 45RM2 require 19UVPS-2120, 19UVPS-2220, or 19MPS-2000 power supply or 192SU3-2120 or -2220 modernization adaptor.

Type 25SU3-2100 Control Parts and Accessories

PART NUMBER	DESCRIPTION
25SU3-2100	Flame Amplifier
60-2471-1	Half-rack (includes one 60-2478 Type F connector) 4 slots.
60-2471-3	Full rack (Includes one 60-2478 Type F connector) 8 slots.
60-2478	Type F screw terminal straight-style connector (12AWG) for 25SU3-2100.
60-2470-1	110VAC input/24VDC power supply (Includes 60-2482) Type H spade connector.
60-2470-2	230VAC input/24VDC power supply (Includes 60-2482) Type H spade connector.
60-2530-1	Surface mount rack (refer to bulletin CU-44).
60-2530-2	Surface mount rack with clear hinged cover (refer to bulletin CU-44).
192SU3-2120	120VAC modernization adaptor. Allows 25SU3-2100 amplifier to plug into existing 60-1706, 60-1499, 60E5527, or 60E5528 wiring rack with little or no rewiring.
192SU3-2220	220VAC version of 192SU3-2120
19MPS-2000	Multi-purpose power supply for two (2) 25SU3-2100 amplifiers and up to four (4) low voltage or line voltage scanners
19UVPS-2120	Power supply (120VAC) required for 45UV5, 45RM1, and 45RM2 flame scanners. (Includes 60-2478 type F screw connector).
19UVPS-2220	Power supply (220VAC) required for 45UV5, 45RM1, and 45RM2 flame scanners. (Includes 60-2478 type F screw connector).
60-2481	Screw terminal, straight style, type H connector for 60-2470-1 and 60-2470-1 power supplies.
60-2482	Spade terminal, straight style, type H connector for 60-2470-1 and 60-2470-2 power supplies.

Type 60-2530 Surface Mount Wiring Rack

The 60-2530 is a surface mount wiring rack for use with the 25SU3-2100 (or 25SU3-2000) amplifier. The 60-2530 wiring rack will hold two (2) 25SU3-2100 amplifiers and one (1) 19MPS-2000 multi-purpose power supply. The 19MPS-2000 operates on either 120 or 220 VAC input power, and provides supply voltage to both 25SU3-2100 amplifiers and up to four (4) low voltage (e.g. 45RM4, 45FS1, 45UVFS1, C9701 and C9707) or line voltage (e.g. 45RM1, 45RM2, 45UV5) flame scanners in any combination. Refer to bulletin CU-45 for detailed information on 19MPS-2000.



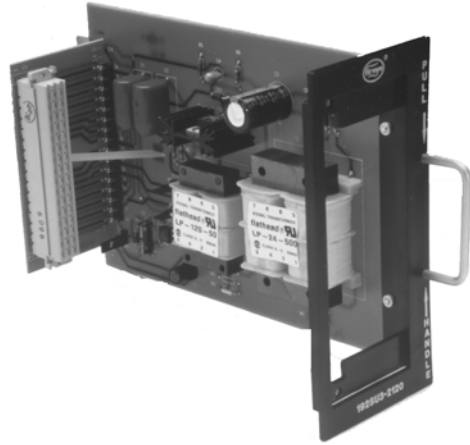
Agency Approvals: FM

PART NUMBER	DESCRIPTION
60-2530-1	Surface mount wiring rack (accommodates 2 amplifiers, 1 power supply).
60-2530-2	Surface mount wiring rack with clear hinged cover.
60-2490-10	Filler plate.

Modernization Adapter

192SU3-2120 (120 VAC), 192SU3-2220 (220 VAC)

The Fireye 192SU3 Modernization Adapter makes it easy to upgrade from an existing 25SU3 type amplifiers using the older style 60-1706, 60-1499, 60E5527, or 60E5528 wiring rack to the Fireye 25SU3-2100 amplifier. The Modernization Adapters provide power to the 25SU3-2100 from either a 120 VAC (192SU3-2120) or 220 VAC (192SU3-2220) source.



The 192SU3-2120, -2220 adapter is compatible with the following Fireye flame scanners: 45UV5, 45RM1, 45RM2, 45RM4, and 45FS1 and 45UVFS1.

Note: The 192SU3-2120, -2220 adapters provide power for the 45UV5, 45RM1, and 45RM2 flame scanners. The 19UVPS-2120, -2220 power supply is not required with these scanners.

The 192SU3-2120, -2220 adapter is directly compatible (“pin for pin”) with the existing wiring in the 60-1706, 60-1499, 60E5527, or 60E5528 mounting rack on most applications. However, on some installations, electrical and/or mechanical changes may be required (Refer to Bulletin CU-36). The following table lists the present controls and the appropriate adapter required to convert that control to the 25SU3-2100 amplifier.

AMPLIFIER TO UPGRADE	ADAPTER PART NUMBER	NEW AMPLIFIER
25SU3-4163	192SU3-2120	25SU3-2100
25SU3-4167		
25SU3-4170		
25SU3-4172		
25SU3-5172		
25SU3-4167T		
25SU3-4171	192SU3-2220	
25SU3-4164		
25SU3-4168		
25SU3-4168T		
25SU3-5173		
The 192SU3-2120, -2220 adapter is not compatible with the 25SU3-4169T control.		

Scanner Power Supply for use with 25SU3-2100 Amplifier 19UVPS-2120 (120 VAC), 19UVPS-2220 (220 VAC)

When using the 25SU3-2100 with any of the following flame scanners, you may use either the 19UVPS-2120 (120VAC) or -2220 (220VAC) power supply to provide power to the scanners:

- 45UV5-1000, -1010, -1101
- 45RM1-1001, -1003
- 45RM2-1000, -1001

NOTE: The 19UVPS-2120, -2220 is not required with the above scanners when the 192SU3-2120, -2220 modernization adaptor or 19MPS-2000 power supply is used.

Each power supply module provides sufficient power to accommodate up to six (6) flame scanners, and plugs into the standard Euro-Card Rack (60-2471-1, -3). A front panel green LED indicates main power on.

Each power supply includes a 60-2478 screw terminal, straight-style, type F connector.

Refer to Bulletin CU-38

NOTE: The 19UVPS-2120, -2220 is not required with the above scanners when the 192SU3-2120, -2220 modernization adaptor or 19MPS-2000 power supply is used.



PART NUMBER	DESCRIPTION	BULLETIN NUMBER
19UVPS-2120	Power supply module (120VAC input voltage) to power 45UV5, 45RM1, and 45RM2 scanners.	CU-38
19UVPS-2220	Power supply module (220 VAC input voltage) to power 45UV5, 45RM1, and 45RM2 scanners.	CU-38

Multi Purpose Power Supply (19MPS-2000)

The 19MPS-2000 is a rack mounted power supply which operates on either 120 or 220 VAC input power (switch selectable - Factory set for 220 VAC operation), and provides supply voltage for two (2) 25SU3-2000, -2100 amplifiers and up to four (4) low voltage (e.g. 45RM4, 45FS1, 45UVFS1, C9701, C9707) or line voltage (e.g. 45RM1, 45RM2, 45UV5) flame scanners in any combination. The 19MPS-2000 will fit into the Fireeye 19" full rack (P/N 60-2471-3), 19" half rack (60-2471-1), or surface mounted wiring rack (60-2530). When used with the 19" full or half rack (60-2471-3,-1), a 60-2481 or 60-2482 connector is required and must be ordered separately. A green LED indicates when power is applied to the 19MPS-2000 power supply.



PART NUMBER	DESCRIPTION
19MPS-2000	Multi-purpose power supply (120 or 220 VAC) - Factory set for 220 VAC operation.
60-2481	Screw terminal type connector for 19MPS-2000
60-2482	Spade terminal type connector for 19MPS-2000

SPECIFICATIONS:

ELECTRICAL

Electrical supply to the 19MPS-2000 is 120 or 220 VAC, 50/60 Hz.
Switch selectable.
Factory set for 220 VAC operation. Maximum current output = 650 ma.

ENVIRONMENTAL

Storage Temp: Minimum: - 4° F (-20° C)
Maximum: 176° F (80° C)

Operating Temp: Minimum: - 4° F (-20° C)
Maximum: 140° F (60° C)

Humidity: Maximum: 85% Relative Humidity (Non-condensing).

24 VDC Power Supply (60-2470-1, -2)

The 60-2470 is a rack mounted power supply that provides the 24 vdc required for up to eight 25SU3-2000, or -2100 amplifiers. The 60-2470 Power Supplies plug into the Fireeye Euro-Card racks, p/n 60-2471-1 (4-position) and 60-2471-3 (8-position). The 60-2480 Power Supply is supplied complete with p/n 60-2482 electrical connector for installation in the Fireeye Euro-Card rack.



PART NUMBER	DESCRIPTION
60-2470-1	Power Supply. 110 vac input, 24 vdc output
60-2470-2	Power Supply. 220-240 vac input, 24 vdc output
60-2482	Connector, spade terminal (included with 60-2470 Power Supply)

SPECIFICATIONS:

ELECTRICAL

Input Voltage:	110 vac (60-2470-1) 220 vac (60-2470-2)
Output:	2.5 A @ 24 vdc

ENVIRONMENTAL

Storage Temp:	Minimum -13° F (-25° C) Maximum 185° F (85° C)
Operating Temp:	Minimum -4° F (-20° C) Maximum 158 F (70° C)

Accessories for Amplifiers and Systems

Flame Signal Meters

PART NUMBER	DESCRIPTION	INPUT SCALE	SIZE	SHIPPING	
				lb.	(kg)
38-54	Panel Meter	0-3 VDC	2 3/8" (60.3) square	1	.45
38-55	Panel Meter	0-3 VDC	1 1/4" (31.8) x 3" (76.2) horizontal	1	.45
38-56	Panel Meter	0-3 VDC	1 1/4" (31.8) x 3" (76.2) vertical	1	.45
38-96	Panel Meter	4-20mA	2 3/8" (60.3) square	1	.45
38-97	Panel Meter	4-20mA	1.6" (40.6) x 3" (76.2) horizontal	1	.45
38-88	Analog Bar Graph Meter (LED) (Requires 24VDC)	0-3 VDC 10 LED's	1.00" (25.4) x 2.2" (55.9) vertical 3.06" (77.7) depth	1	.45

Fireye C9000 Series Flame Scanners

Fireye offers a number of C9000 Series Flame Scanners for use with the R9000 Series Flame Amplifiers. Each scanner incorporates a flame detector (ultraviolet and/or infrared detector) with sensitivity adjustment, and a mechanical light blocking chopper assembly (except model C9506). Most flame scanners are available with either a military style connector or lead wires. Flame scanners with lead wires provide 1/2" NPSM tap for electrical fitting unless otherwise noted. The description of each part number lists the replacement components associated with each scanner.



C9502N

PART NUMBER	DESCRIPTION	FOR USE WITH
C9501N5023	Ultraviolet scanner, 1" NPT mount, 50' lead wires. Consists of DE601-106 and DE601-104F	R9005P, R9105P
C9501N5034	Ultraviolet scanner, 1" NPT mount, military connector. Consists of DE601-106 and DE601-104D.	R9005P, R9105P
C9502N5012	Infrared scanner, 1" NPT mount, 50' lead wires. Consists of DE601-108A and DE601-104F.	R9005P, R9105P
C9502N5023	Infrared scanner, 1" NPT mount, military connector. Consists of DE601-108A and DE601-104D	R9005P, R9105P
C9502Q6001	Luminescent Scanner, 1"NPT mount, 50' lead wires. Consists of DE601-114 and DE601-104F.	R9005P, R9105P
C9502Q6012	Luminescent scanner, 1" NPT mount, military connector. Consists of DE601-114 and DE601-104D.	R9005P, R9105P
C9506M1085	Ultraviolet, non self-check pipe style scanner, 1" NPT mount, 8' lead wires with 1.25" threaded connector.	R9006M
C9506M1096	Ultraviolet, non-self-check pipe-style scanner, 1" NPT mount, 50' lead wires with 1.25" threaded connector.	R9006M
C9507N4001	All fuel scanner IR/UV, 1" NPT mount, 50' lead wires. Consists of DE601-113 and DE601-104F.	R9005P, R9105P
C9507N4012	All fuel scanner IR/UV, 1" NPT mount, military connector. Consists of DE601-113 and DE601-104D.	R9005P, R9105P
C9508M2000	Ultraviolet pipe-style scanner, 1" NPT mount, military style connector.	R9008M, R9108M
C9508M2011	Ultraviolet pipe-style scanner, 1" NPT mount. 10' lead wires with 3/4" threaded connector.	R9008M, R9108M
C9508M2022	Ultraviolet pipe-style scanner, 1" NPT mount. 10' lead wires with 25mm threaded connector.	R9008M, R9108M
C9701A1012	Ultraviolet scanner, 1" NPT mount, military connector. Consists of DE701-107A and DE601-104G.	R9107A, 25SU3-2100
C9701A1023	Conformally coated. UV scanner, 1" NPT mount, military connector. Consists of DE701-107C and DE601-104G.	R9107A, 25SU3-2100
C9707A1012	All fuel scanner UV/IR, 1" NPT mount, military connector. Consists of DE701-007A and DE601-104G.	R9107A, 25SU3-2100
C9707A1023	Conformally coated. All fuel scanner UV/IR, 1" NPT mount, military connector. Consists of DE701-007C and DE601-104G.	R9107A, 25SU3-2100

Accessories for Fireye C9000 Series Flame Scanners

PART NUMBER	DESCRIPTION
DE601-104D	Scanner base with 3/4" purge opening and military connector for C9501N5034, C9502N5023, C9502Q6012, C9507N4012, C9509P1001.
DE601-104F	Scanner base with 3/4" purge opening and 50 foot wire leads for C9501N5023, C9502N5012, C9502Q6001, C9507N4001.
DE601-104G	Scanner base with 3/4" purge opening and military connector for all C9701 and C9707 scanners.
DE601-106	Scanner electronic assembly for C9501N series.
DE601-106C	Scanner electronic assembly for C9501N series - conformally coated.
DE601-108A	Scanner electronic assembly for C9502N series.
DE601-108AC	Scanner electronic assembly for C9502N series - conformally coated.
DE601-113	Scanner electronic assembly for C9507N series.
DE601-113C	Scanner electronic assembly for C9507N series - conformally coated.
DE601-114	Scanner electronic assembly for C9502Q series.
DE701-007A	Scanner electronic assembly for C9707A series.
DE701-007C	Scanner electronic assembly for C9707A series - conformally coated.
DE701-107A	Scanner electronic assembly for C9701A series.
DE701-107C	Scanner electronic assembly for C9701A series - conformally coated.
DE601-08	Connector replacement for 8' lead wire base (DE601-104E).
DE601-006	Connector kit for use with 500287-001 cable (with cable clamp style fitting).
DE601-006B	Connector kit for use with 500287-001 cable (with flexible conduit adapter).
DE4360-XXX	Pre-wired cable/connector clamp assembly with Hypalon cable (500287-001) in specified lengths. Last 3 digits of part number specify length in 20 foot increments up to 200 feet.
DE4599-XXX	Pre-wired cable/connector clamp assembly, with conduit adapter and Hypalon cable (500287-001) in specified lengths. Last 3 digits of part number specify length in 20 foot increments up to 200 feet.
DE4606-001	Orifice kit for C9501, C9502, and C9507 scanners. Consists of three orifices (0.125, 0.187, 0.250) and one retaining ring.
DE5213-001	Shutter tube assembly for C9508M.
Q2625A1303	Swivel mount assembly with flange mount.
Q2625A1314	Swivel mount assembly with 2" NPT mount.
000710-023	Test cable for use with C9501, C9502, C9507, C9701, and C9707 scanners.
500287-001	16 AWG 600 volt five conductor Hypalon cable (Used in DE4360, DE4599).

Fireye C9000 Series Fiber Optic Scanners

Fireye offers C9000 Series flame scanners for use with fiber optic assemblies for applications where a direct line of sight of the flame is not available. The fiber optic scanner part numbers include a scanner electronics assembly, termination assembly, compression fitting, and zero degree offset lens. The fiber optic inner carrier, outer carrier and fiber optic bundle must be ordered separately.



PART NUMBER	DESCRIPTION	FOR USE WITH
C9503M-001	Infrared fiber optic scanner for heavy oil/coal. Consists of DE601-110, DE601-112B, DE601-16, DE601-18, DE601-20A1.	R9005P, R9105P
C9504M-001	Ultraviolet/Visible light fiber optic scanner for gas/light oil. Consists of DE601-111, DE601-112B, DE601-16, DE601-18, DE601-20A1.	R9005P, R9105P

Fiber Optic Inner Carriers for C9000 Series Scanners

PART NUMBER	DESCRIPTION
003263-001	Inner carrier assembly (72 inches) for use with all fiber optic scanners.
003263-002	Inner carrier assembly (85 inches) for use with all fiber optic scanners.
003263-003	Inner carrier assembly (120 inches) for use with all fiber optic scanners.
003263-004	Inner carrier assembly (100 inches) for use with all fiber optic scanners.



(SHOWN WITH TERMINATION ASSEMBLY INSTALLED)

Fiber Optic Outer Carriers for C9000 Series Scanners

PART NUMBER	DESCRIPTION
003265-001	Outer carrier assembly (72 inches) for use with all fiber optic scanners.
003265-002	Outer carrier assembly (85 inches) for use with all fiber optic scanners.
003265-003	Outer carrier assembly (120 inches) for use with all fiber optic scanners.
003265-004	Outer carrier assembly (100 inches) for use with all fiber optic scanners.



(SHOWN WITH INNER CARRIER, TERMINATION ASSEMBLY AND COMPRESSION FITTING INSTALLED)

Fiber Optic Bundles for C9000 Series Scanners

PART NUMBER	DESCRIPTION
101806-001	Metal sheathed glass fiber optic bundle (72 inches) for use with C9503M-001, C9503P-002, C9503P-003, C9504M-001.
101806-002	Metal sheathed glass fiber optic bundle (85 inches) for use with C9503M-001, C9503P-002, C9503P-003, C9504M-001.
101806-003	Metal sheathed glass fiber optic bundle (120 inches) for use with C9503M-001, C9503P-002, C9503P-003, C9504M-001.
101806-004	Metal sheathed glass fiber optic bundle (100 inches) for use with C9503M-001, C9503P-002, C9503P-003, C9504M-001.
102531-001	Metal sheathed quartz fiber optic bundle (72 inches) for use with C9504P-002, C9504P-003.
102531-002	Metal sheathed quartz fiber optic bundle (85 inches) for use with C9504P-002, C9504P-003.
102531-003	Metal sheathed quartz fiber optic bundle (120 inches) for use with C9504P-002, C9504P-003.
102531-004	Metal sheathed quartz fiber optic bundle (100 inches) for use with C9504P-002, C9504P-003.



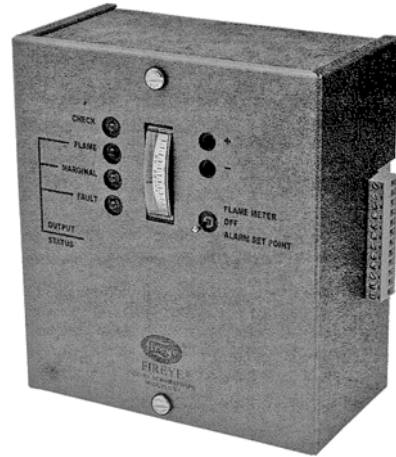
(SHOWN WITH LENS ASSEMBLY INSTALLED)

Accessories for C9000 Series Scanners Fiber Optic Scanners

PART NUMBER	DESCRIPTION
DE601-16	Stainless steel fiber optic termination assembly.
DE601-18	Cast metal compression fitting with graphite gasket.
DE601-20A1	0 degree offset lens assembly.
DE601-20B1	5 degree offset lens assembly.
DE601-20C1	9 degree offset lens assembly.
DE601-20D1	14 degree offset lens assembly.
DE601-110	Electronics assembly for C9503M-001 fiber optic scanner.
DE601-111	Electronics assembly for C9504M-001 fiber optic scanner.
DE601-112B	Fiber optic scanner base with 3/4" purge opening and military connector. For C9503M-001, C9503P-003, C9504M-001, and C9504P-003.
DE601-112C	Fiber optic scanner base with 3/4" purge opening and 8 ft. lead wires. For C9503M-001, C9503P-003, C9504M-001, and C9504P-003.
DE601-112D	Fiber optic scanner base with 3/4" purge opening and 40 ft. lead wires. For C9503M-001, C9503P-003, C9504M-001, and C9504P-003.
DE601-112E	Fiber optic scanner base with 3/4" purge opening and military connector. For C9503P-002 and C9504P-002.
Q9050A1000	Mounting adaptor for CE fiber optic flame scanner mount.

Fireye R9000 Series Flame Amplifiers

Fireye offers a number of Series R9000 Flame Amplifiers for use with the Series C9000 Flame Scanners. Most flame amplifiers provide a flame relay, marginal alarm relay, adjustable flame threshold, adjustable flame failure response time (FFRT), built-in flame meter, 0-10 VDC output for a remote flame meter, and two separate adjustable gain settings selectable via external contacts.



R90005P

PART NUMBER	DESCRIPTION	FOR USE WITH
R9005P5001	Panel mount flame amplifier with selectable jumpers.	C9501N, C9502N, C9502Q, C9503M, C9503P, C9504M, C9504P, C9507N, C9509P
R9105P5002	Rack mounted flame amplifier with selectable jumpers. Replaces all R9105N models.	C9501N, C9502N, C9502Q, C9503M, C9503P, C9504M, C9504P, C9507N, C9509P
R9006M3000	Panel mount flame amplifier. 120 VAC operation.	C9506M
R9006M3011	Panel mount flame amplifier. 220 VAC operation.	C9506M
R9008M4001	Panel mount flame amplifier. 120 / 240 VAC operation.	C9508M
R9107A1001	Rack mount flame amplifier with selectable jumpers.	C9701A, C9707A,
R9108M1001	Rack mount flame amplifier. 120 / 240 VAC operation.	C9508M

Accessories for R9000 Series Flame Amplifiers

PART NUMBER	DESCRIPTION
DE4643-001	4-20ma output module for use with R9005P, R9105P, R9107A.
Q9105	Rack (Enables replacement of R9001M amplifier).
Q9801C1124	8 Position mounting rack for R9105, R9108 , R9107.
Q9801C1126	8 Position mounting rack (with jumpers) for R9105, R9108 , R9107.
003181-001	K1 relay for R9001M flame amplifier.
101363-002	Replacement fuse for R9005P, R9107A flame amplifier.
101796-002	Replacement 0-10 VDC flame meter for R9005P, R9105P, R9107A

SureFire™ High Energy Spark Igniters

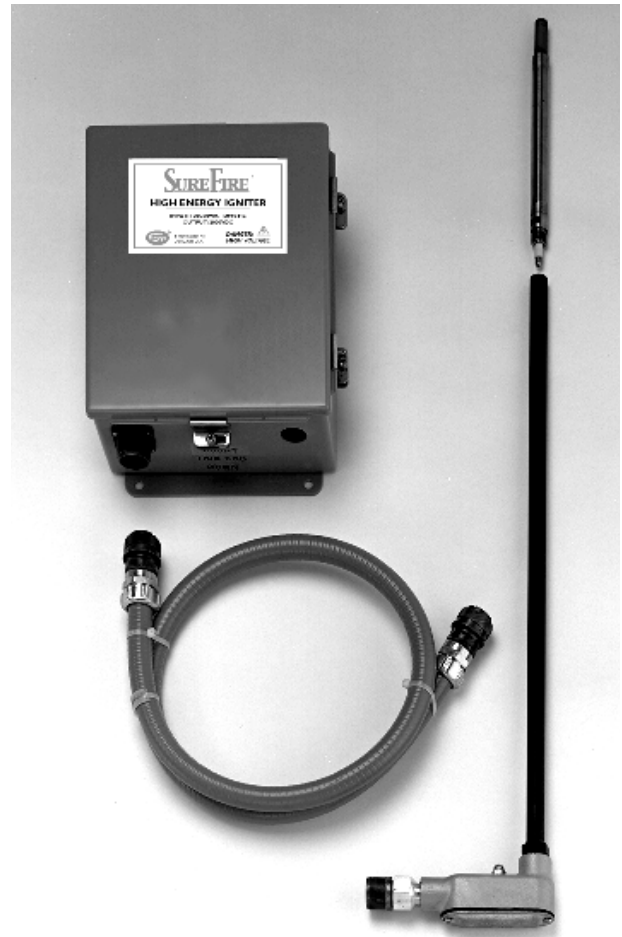
The High Energy Igniters (HEI) are Class 3 igniters used for direct spark ignition of oil or gas igniters and small burners. The 12 joules of power delivered to the spark tip (3 sparks per second) easily ignites the fuel.

The HEI igniters consist of three major components: a power pack, a spark rod assembly and a cable assembly. The power pack is packaged in a NEMA-4 enclosure for wall mounting at the burner front. The power pack develops the 12 joules of power delivered to the spark tip through the use of heavy duty electrical components. It has a 100% duty cycle at temperatures up to 130°F ambient.

The spark rod features a self-cleaning surface gap spark tip that is easily replaceable through a threaded connection. The spark rods can come with an optional retraction assembly to allow the spark tip to be inserted and retracted from the firing position if necessary.

The cable assembly consists of heavy duty 12-gauge, 3,000 volt wire sheathed in a 1/2" flexible conduit terminated with quick release, military-grade connectors.

Refer to Bulletin SF-1 for complete information.



Spark Rod (Includes Firing Tip)

Part Number	Description
SFR-014	HEI Spark Rod 14"
SFR-180	HEI Spark Rod 18"

Spark rods are available in incremental 2" lengths from 14" up to 180".

Power Pack

Part Number	Description
SF1-1	SureFire HEI Power Pack, 110 vac, NEMA 4 (painted steel)
SF1-2	SureFire HEI Power Pack, 220 vac, NEMA 4 (painted steel)
SF1-3	SureFire HEI Power Pack, 110 vac, NEMA 4X (stainless)
SF1-4	SureFire HEI Power Pack, 220 vac, NEMA 4X (stainless)

SureFire™ High Energy Spark Igniters

Interconnecting Cable

Part Number	Description
SF1-CA1-06	SureFire HEI interconnecting cable with connectors, 6 ft.
SF1-CA1-09	SureFire HEI interconnecting cable with connectors, 9 ft.
SF1-CA1-12	SureFire HEI interconnecting cable with connectors, 12 ft.
SF1-CA1-15	SureFire HEI interconnecting cable with connectors, 15 ft.

Fixed Mount Mounting Tubes

Part Number	Description
MT1-006	Mount Tube 6" long (igniter lengths 014 through 020)
MT1-016	Mount Tube 16" long (igniter lengths 022 through 030)
MT1-026	Mount Tube 26" long (igniter lengths 032 through 040)
MT1-036	Mount Tube 36" long (igniter lengths 042 through 050)
MT1-046	Mount Tube 46" long (igniter lengths 052 through 060)
MT1-056	Mount Tube 56" long (igniter lengths 062 through 070)
MT1-066	Mount Tube 66" long (igniter lengths 072 through 080)
MT1-076	Mount Tube 76" long (igniter lengths 082 through 090)
MT1-086	Mount Tube 86" long (igniter lengths 092 through 100)
MT1-096	Mount Tube 96" long igniter lengths 102 through 110)
MT1-106	Mount Tube 106" long (igniter lengths 112 through 120)
MT1-116	Mount Tube 116" long (igniter lengths 122 through 130)
MT1-126	Mount Tube 126" long (igniter lengths 132 through 140)
MT1-136	Mount Tube 136" long (igniter lengths 142 through 150)
MT1-146	Mount Tube 146" long (igniter lengths 152 through 160)
MT1-156	Mount Tube 156" long (igniter lengths 162 through 170)
MT1-166	Mount Tube 166" long (igniter lengths 172 through 180)

Retractor Assemblies

Part Number	Description
SF1-RET-1	Retractor Assembly, 6" Stroke, 110 vac solenoid
SF1-RET-2	Retractor Assembly, 6" Stroke, 220 vac solenoid
SF1-RET-3	Retractor Assembly, 9" Stroke, 110 vac solenoid
SF1-RET-4	Retractor Assembly, 9" Stroke, 220 vac solenoid
SF1-RET-5	Retractor Assembly, 12" Stroke, 110 vac solenoid
SF1-RET-6	Retractor Assembly, 12" Stroke, 220 vac solenoid

SureFire™ High Energy Spark Igniters

Retraction Mounting Tubes

Part Number	Description
MT1R-022	Retraction Mounting Tube, 22"
MT1R-168	Retraction Mounting Tube, 168"

Retraction Mounting Tubes are available in several incremental lengths (consult factory).

Replacement / Spare Parts - High Energy Igniters

Part Number	Description
145-18	HEI Spark Tip 8" (used with igniter lengths 036 and shorter)
145-19	HEI Spark Tip 27" (used with igniter lengths 038 and longer)
7-1738	HEI Power Pack Capacitor
5-563	HEI Power Pack Transformer
8-705	Solenoid and Coil (for HEI Retraction Assembly), 110 vac
8-706	Solenoid and Coil (for HEI Retraction Assembly), 220 vac
70-426	Coil (for Retraction Assembly), 110 vac
70-427	Coil (for Retraction Assembly), 220 vac
129-174	HEI Spark Gap Replacement Kit

SureFire 20 Gas Igniters and Accessories

The SureFire Model 20 Gas Igniter provides reliable ignition energy for main gas or oil burners in either NFPA Class 1, Class 2 or Class 3 application, depending on the burner capacity. These igniters easily retrofit into many types of burners due to their size, one million BTUH capacity and their reliable operation.

The SureFire Gas Igniter consists of three major components: a guide tube, a gas transport tube, and a High Energy spark rod. The guide tube houses the spark rod and the gas transport tube, which are easily removed from the guide tube for maintenance purposes, by releasing the “V” band retainer. No tools are required.



Cooling/combustion airflow is directed down the guide tube to support and maintain the primary combustion zone during operation and to cool the igniter when it is out of service. The controlled mixture of fuel and air inside the igniter guide tube at the primary combustion zone results in a highly reliable igniter.

The SureFire Gas Igniter is used with a High Energy Igniter (HEI) spark source (power pack) and interconnecting cable, both ordered separately. The HEI produces a powerful 12-joule spark three times per second at the primary combustion zone. The HEI spark tip is a nonfouling, surface-gap spark plug that is replaceable as a unit by a threaded connection. The remaining HEI components consist of a positioning rod (included with the Gas Igniter), power cable, and power pack (the cable and power pack are ordered separately).

Optional equipment for the SureFire Model 20 Gas Igniter includes a mount tube, a gas hose, and a rubber air hose.

SureFire 20 Gas Igniters (Includes HEI Spark Rod)

Part Number	Description
SF20-014	SureFire 20 Gas Igniter 14" long
SF20-180	SureFire 20 Gas Igniter 180" long

SureFire 20 Gas Igniters are available in incremental 2" lengths from 14" up to 180".

SureFire 20 Gas Igniters and Accessories

Mounting Tubes

Part Number	Description
MT20-004	Mount Tube 4" long (igniter lengths 014 through 020)
MT20-012	Mount Tube 12" long (igniter lengths 022 through 030)
MT20-022	Mount Tube 22" long (igniter lengths 032 through 040)
MT20-032	Mount Tube 32" long (igniter lengths 042 through 050)
MT20-042	Mount Tube 42" long (igniter lengths 052 through 060)
MT20-052	Mount Tube 52" long (igniter lengths 062 through 070)
MT20-062	Mount Tube 62" long (igniter lengths 072 through 080)
MT20-072	Mount Tube 72" long (igniter lengths 082 through 090)
MT20-082	Mount Tube 82" long (igniter lengths 092 through 100)
MT20-092	Mount Tube 92" long igniter lengths 102 through 110)
MT20-102	Mount Tube 102" long (igniter lengths 112 through 120)
MT20-112	Mount Tube 112" long (igniter lengths 122 through 130)
MT20-122	Mount Tube 122" long (igniter lengths 132 through 140)
MT20-132	Mount Tube 132" long (igniter lengths 142 through 150)
MT20-142	Mount Tube 142" long (igniter lengths 152 through 160)
MT20-152	Mount Tube 152" long (igniter lengths 162 through 170)
MT20-162	Mount Tube 162" long (igniter lengths 172 through 180)

Accessories

Part Number	Description
GH20-04	Gas Hose, 1/2" flexible stainless steel braid, 3/4 (NPT), 4 ft.
GH20-06	Gas Hose, 1/2" flexible stainless steel braid, 3/4 (NPT), 6 ft.
GH20-08	Gas Hose, 1/2" flexible stainless steel braid, 3/4 (NPT), 8 ft.
35-309	Close nipple, 1/2"NPT stainless steel
10-211	Quick Disconnect Plug, male 1/2" NPT
148-21	In-Line Pressure Tester (fuel gas)
9-438	Quick Disconnect Socket, female, 1/2" NPT
59-495	Air Hose, flexible. Rubber 1" (I.D.) x 10 ft.

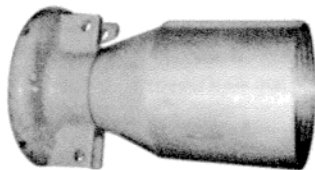
Replacement / Spare Parts

Part Number	Description
13-382	Rear Flange Clamp
29-403	Rear Flange Gasket
145-18	HEI Spark Tip 8" (used with igniter lengths 036 and shorter)
145-19	HEI Spark Tip 27" (used with igniter lengths 038 and longer)

Scanner and Amplifier Accessories

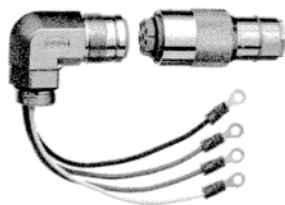
<p>35-200</p>  <p>1 inch "Y" connector (NPT)</p>	<p>35-201</p>  <p>1 inch close nipple (NPT)</p>	<p>35-202</p>  <p>3/8" plug (NPT)</p>
<p>35-240</p>  <p>1 inch close nipple (BSP)</p>	<p>38-54</p>  <p>Flame meter 2 1/4 inch</p>	<p>38-55</p>  <p>Flame meter horizontal</p>
<p>38-56</p>  <p>Panel voltmeter</p>	<p>38-62</p>  <p>Flame meter horizontal</p>	<p>38-88</p>  <p>Analog bar graph meter (LED)</p>
<p>4-290-2</p>  <p>UV Tube (for 45UV5 Eng. code ≥ 04 only)</p>	<p>59-470</p>  <p>6-wire scanner cable</p>	<p>59-471</p>  <p>8-wire scanner cable</p>

60-1622



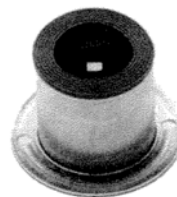
Long Range Assembly

60-2366



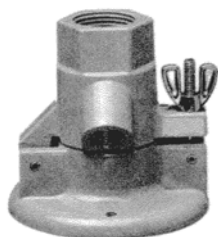
Quick disconnect kit for 45UV5,
45RM1, 45RM2

61-2275-2



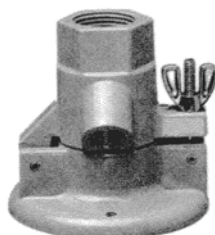
Quartz lens assembly

61-2841-1



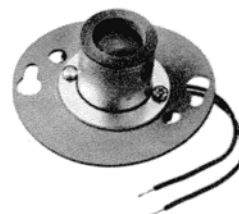
NPT Hinged Flange

61-2841-2



BSP Hinged Flange.

61-7203



Shutter and lens assembly for
45UV5-1000, -1010, -1101
(for 45UV5 Eng. code \geq 04 only)

69-2914-1



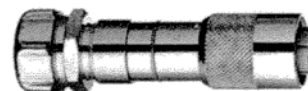
Shutter and bracket assembly for
45UV5-1000, -1010, -1101

101-78



Diode

129-127-6



Female quick-disconnect kit

Fireye District Sales Offices

UNITED STATES SALES OFFICES

Boston Area

5 Belmont Terr.
Derry, NH 03038
Tel. (603) 965-3786
Fax. (603) 965-3786

Cleveland Area

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Garfield Heights, OH 44125
(216) 518-2950
FAX: (216) 274-9117

Columbus Area

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Columbus, OH 43212
(614) 291-5380
FAX: (216) 274-6379

Minnesota Area

2914 Pennsylvania Avenue, South
St. Louis Park, MN 55426
(952) 926-3088
FAX: (952) 926-3374

New York Area

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Rochelle Park, NJ 07662
(201) 291-7790
FAX: (201) 368-1758

Philadelphia Area

42 Reads Way
Suite 111
New Castle, DE 19720
(302) 323-8122
FAX: (302) 323-8105

South East Area

1629 SE North Blackwell Drive
Port St. Lucie, FL 34952
(772) 237-5428

South West Area

25613 West Magnolia St.
Buckeye, AZ 85326
(623) 236-8521
FAX: (623) 236-8592

Sacramento Area

9715 Poplar Court
Live Oak, CA 95953
(916) 979-7017
FAX: (503) 695-2067

Tulsa Area

2600 North 10th Street
Broken Arrow, OK 74012
(918) 355-8865
FAX: (918) 355-8874

CANADIAN SALES OFFICES

Montreal

452 rue Bourque, Suite 900A
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(450) 585-8897
FAX: (450)657-8898

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309 - 1st Street West
High River, Alberta T1V 1P7
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FAX: (403) 603-3289

INTERNATIONAL SALES OFFICES

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Berkshire, UK SL3 OHB
44-1753-766363
FAX: 44-1753-684540

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Kidde de México, S.A. de C.V.
Av. Insurgentes Sur No.1685, Piso 14
Col. Guadalupe Inn, C.P. 01020
México, D.F.
52-55-5677-5146
FAX: 52-55-1290-5858

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Fireye/Forney Corp.
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65-6424-7950
FAX: 65-6424-7978

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Unit 18, 7/F, Tower III
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Dong Cheng District
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FAX: 86-1-6518-7427

So Africa

Fireye/Forney Corp.
23 Whitehouse Avenue
Farrarmere
Benoni
Gauteng 1501
South Africa
Tel. +27 (0) 11 0251614
Fax. +27 (0) 86 6772001

Fireye General Terms and Conditions of Sale

THE FOLLOWING TERMS AND CONDITIONS SHALL GOVERN THE ENTIRE RELATIONSHIP BETWEEN FIREYE (FIREYE) AND THE PURCHASER INCLUDING, BUT NOT LIMITED TO, ALL NEGOTIATIONS, ORDERS, ACCEPTANCES, SALES AND DELIVERIES. NO TERM OR CONDITION OR OTHER UNDERSTANDING, ORAL OR WRITTEN, IN ANY WAY PROPOSING TO VARY OR EXPAND UPON THESE TERMS AND CONDITIONS, WHETHER CONTAINED IN THE PURCHASER'S FORMS OR ELSEWHERE, SHALL BE BINDING ON FIREYE, ITS SUCCESSORS OR ASSIGNS, UNLESS IN WRITING AND SIGNED BY AN OFFICER OF FIREYE.

1. WARRANTIES, EXCLUSIVE REMEDIES, AND LIMITATION OF DAMAGES:

Fireye guarantees for one year from the date of installation or 18 months from the date of manufacture to replace, or at its option, to repair any product or part thereof which Fireye, in its sole discretion, deems to be defective in material or workmanship or which otherwise fails to conform to the description of the product on the face of its sales order. Fireye's obligations pursuant to this warranty do not extend to any products or parts thereof which Fireye determines to have been installed, operated, maintained, repaired, or altered improperly or otherwise than in conformity to Fireye's applicable instructions, or which have been subject to misuse, accident or neglect.

THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, BOTH EXPRESS AND IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS SPECIFICALLY STATED IN THESE TERMS AND CONDITIONS OF SALE, REMEDIES WITH RESPECT TO ANY PRODUCT OR PART MANUFACTURED OR SOLD BY FIREYE, OR WITH RESPECT TO ANY BREACH OF OR DEFAULT UNDER THIS CONTRACT (INCLUDING ANY BREACH OF WARRANTY), SHALL BE LIMITED EXCLUSIVELY TO THE RIGHT TO REPLACEMENT OR REPAIR F.O.B. FIREYE MAIN WAREHOUSE LOCATION, AS ABOVE PROVIDED. IN NO EVENT SHALL FIREYE BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY NATURE WHICH MAY ARISE IN CONNECTION WITH SUCH PRODUCT OR PART OR ANY BREACH OF OR DEFAULT UNDER THIS CONTRACT.

TO THE EXTENT PERMITTED BY LAW, THE AGGREGATE LIABILITY OF SELLER HEREUNDER WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE) OR OTHERWISE, WILL BE LIMITED TO ONE TIMES THE CONTRACT VALUE, PROVIDED HOWEVER THE FOREGOING LIMITATION DOES NOT LIMIT THE LIABILITY OF SELLER FOR ANY INJURY TO, OR DEATH OF A PERSON, CAUSED BY THE GROSS NEGLIGENCE OF SELLER.

2. ACCEPTANCE OF ORDERS: Fireye shall have no obligation, nor shall Fireye be bound, with respect to any order, unless the order has been accepted by an authorized employee of Fireye. At its discretion, Fireye may elect to reject any orders submitted by Purchaser.

3. SHIPMENT: All prices are F.O.B. Fireye main warehouse location. Method and route of shipment are at Fireye's discretion, unless the Purchaser supplies explicit instructions on the face of the sales order in which case the Purchaser shall pay any additional transportation costs occasioned by such instructions. Purchaser assumes all risk of loss or damage to the products during shipment and is responsible for insuring such products for their purchase price.

4. DELIVERY AND FORCE MAJEURE: Under no circumstances shall Fireye be liable for any loss, damage or delay due to any cause beyond its reasonable control, including but not limited to acts of government, strikes, lockouts, other labor disputes, fire, explosion, theft, weather damage, flood, earthquake, riot, civil commotion, war, malicious mischief or act of God.

5. TAXES: The amount of any present or future sales, revenue, excise or other taxes applicable to the products listed herein shall be added to the purchase price and shall be paid by the Purchaser, or in lieu thereof the Purchaser shall provide Fireye with a tax exemption certificate acceptable to relevant taxing authorities.

6. QUOTATIONS AND PRICES: Prices are subject to change without notice and orders calling for future delivery will be billed according to the price in effect at the time of delivery. A \$100.00 net minimum billing applies to all orders. Written quotations are effective only if made on Fireye's standard quotation form and, in any event, such quotations shall automatically expire sixty (60) calendar days from the date issued and are subject to earlier termination by notice at any time during that 60-day period. Payment terms are as stated on the invoice or net thirty days when not specified.

7. CANCELLATIONS, MODIFICATIONS AND RETURNS: Once placed, orders may be cancelled or modified by the Purchaser only with the written consent of Fireye in its sole discretion. If such consent is given and an order is cancelled or modified, the Purchaser shall reimburse Fireye for all expenses (as determined by Fireye in its sole discretion) incurred prior to such cancellation or as a result of such modification and pay such cancellation fee as Fireye may determine in its sole discretion.

Goods may be returned only with the prior written authorization of Fireye and shall be subject to such fees and restocking charge as may be determined by

Fireye, in its sole discretion. All goods returned pursuant to Fireye's authorization shall be shipped with shipping charges prepaid and securely packed so as to reach Fireye without damage.

8. PATENT INFRINGEMENT: If suit is brought against Purchaser alleging that the manufacture or sale of products sold hereunder infringes any United States patent (except infringement occurring as a result of incorporating a design or modification of the goods at Purchaser's request, or occurring as a result of Purchaser's failure to use the goods in the manner directed and exclusively for the purposes for which they are sold), then Fireye will defend, indemnify and hold harmless Purchaser and pay any awards against Purchaser arising from such infringement; provided, however, that Purchaser has given Fireye (a) prompt written notice of any charge of such infringement, (b) the right at its expense to settle such charge or to defend or control the defense of any suit based upon such charge, and (c) all necessary information and assistance in connection therewith. In case any product sold hereunder is held to infringe an existing patent and the use of said product is enjoined, Fireye shall have the option of either procuring for the Purchaser the right to continue using said product, or replacing the same with a non-infringing product, or modifying the same so as to avoid infringement, or removing the same and refunding the purchase price. THIS PARAGRAPH SETS FORTH FIREYE'S SOLE AND EXCLUSIVE LIABILITY WITH RESPECT TO PATENT INFRINGEMENT.

9. TRADEMARKS AND TRADE NAMES: Purchaser acknowledges that all brand names, trade names and trademarks incorporated onto or associated with the products (collectively, the Marks) purchased hereunder are the exclusive property of Fireye and that the Purchaser will not acquire any rights in any of the Marks by purchasing the products hereunder. Purchaser shall not make any use of the Marks at any time except as otherwise authorized in writing by Fireye.

10. PROPRIETARY INFORMATION/NONDISCLOSURE: Purchaser acknowledges that any knowledge or information, including drawings and data, which Fireye may have disclosed or may hereafter disclose to the Purchaser incident to the placing and filling of this order, shall, at all times, remain the exclusive property of Fireye, and Purchaser shall acquire no interest in, or right with respect to, such proprietary information unless otherwise stated in writing by Fireye. Purchaser further acknowledges that such proprietary information constitutes valuable, special and unique business assets of Fireye and Purchaser will not now or at any time in the future use any such information in any manner or disclose any such information to any person or entity, except as expressly permitted in writing by Fireye.

11. DEFAULT/REMEDIES AND TERMINATION: In the event that Purchaser fails to make payment when due for goods shipped to it or otherwise breaches any provision of this Contract, Purchaser shall be liable for any loss suffered by Fireye by reason of such action including but not limited to, costs of collection, attorneys' fees, loss of Fireye's profits, and additional freight, storage and handling costs. In such event, Fireye, at its sole discretion, may also terminate this Contract, require that any shipment be made C.O.D., demand cash in advance prior to filling any orders from the Purchaser and place the Purchaser on credit hold. The above-listed remedies are cumulative and in addition to any other remedies available to Fireye at law or in equity.

12. INDEMNIFICATION: Purchaser shall indemnify, defend and hold harmless Fireye from and against any and all claims, losses, liabilities and expenses (including without limitation, attorneys' fees) on account of any injuries or deaths of any persons or damage to any property arising from the sale and use of goods sold by the Purchaser in which the products sold hereunder are incorporated.

13. DISPUTE RESOLUTION: Any disputes arising under this Contract shall be referred to binding arbitration in Boston, Massachusetts under the commercial arbitration rules of the American Arbitration Association.

14. GOVERNING LAW: This Contract shall be governed and interpreted in accordance with the laws of the State of New Hampshire. The state courts of New Hampshire and the U.S. District Court for the District of New Hampshire shall have exclusive jurisdiction with respect to claims made hereunder.

15. NON-WAIVER: Failure by either party to exercise any of its rights under this Contract upon one occasion shall not constitute a waiver of its right to exercise the same or other rights on another occasion.

16. ASSIGNMENTS: Purchaser may not assign or transfer any of its rights or duties under this Contract without the written consent of Fireye. Fireye may, in its sole discretion, assign or transfer any or all of its rights or duties under this Contract to any person or entity, including without limitation any affiliate of successor.

17. SEVERABILITY: In the event any provision herein should be held unenforceable by a court of competent jurisdiction, such court is hereby authorized to amend such provision so that it will be enforceable to the fullest extent permitted by law, and all remaining provisions shall continue in full force without being affected, impaired or invalidated thereby in any way.



Thinking Beyond the Traditional...

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