SIEMENS

Marine Fire Detection System Manual

System 3™ Control Panel

US Coast Guard Approved Certificate No. (Cert No:161.002/17/8)

Reference
ULI File No. S522

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P/N 315-086283-9

U. S. Department of Homeland Security
United States Coast Guard
Certificate of Approval

Coast Guard Approval Number: 161.002/17/8 Expires: 19 August 2019

FIRE PROTECTIVE SYSTEM

SIEMENS INDUSTRY, INC.
8 FERNWOOD DRIVE
FLORHAM PARK NJ 07932

SIEMENS SYSTEM 3 MARINE FIRE DETECTION SYSTEM

INCLUDES Control Unit, Repeater Units, Modules, Accessories, Initiating Devices and Notification Devices listed in Equipment List P/N SYSTEM3-M-03 REV-3-2/05 attached to the manual noted below.

Identifying Data: SIEMENS Marine Smoke Detection System Manual, System 3 Control Panel, P/N 315-086283-9, with typical connection diagram.

Test Reports by: Underwriters Laboratories, Inc. File № S522 and Retlif Testing Laboratories Test Report R-10189, Rev A dated 11 February 2005.

Supersedes Certificate № 161.002/17/8 dated 11 January 2010 to extend the approval.

*** END ***

THIS IS TO CERTIFY THAT the above named manufacturer has submitted to the undersigned satisfactory evidence that the item specified herein complies with the applicable laws and regulations as outlined on the reverse side of this Certificate, and approval is hereby given. This approval shall be in effect until the expiration date hereon unless sooner canceled or suspended by proper authority.

GIVEN UNDER MY HAND THIS 19th DAY OF AUGUST 2014, AT WASHINGTON D.C.

K. J. HEINZ
Chief, Lifesaving and Fire Safety Division
BY DIRECTION OF THE COMMANDANT

DEPT. OF HOMELAND SECURITY, USCG, CGHQ-10030
(REV. 3-03)

TERMS: The approval of the item described on the face of the Certificate has been based upon the submittal of satisfactory evidence that the item complies with the applicable provisions of the navigation and shipping laws and the applicable regulations in Title 33 and/or Title 46 of the Code of Federal Regulations. The approval is subject to any conditions noted on this Certificate and in the applicable laws and regulations governing the use of the item on vessels subject to Coast Guard inspection or on other vessels and boats.

Consideration will be given to an extension of this approval provided application is made 3 months prior to the expiration date of this Certificate.

The approval holder is responsible for making sure that the required inspections or tests of materials or devices covered by this approval are carried out during production as prescribed in the applicable regulations.

The approval of the item covered by this certificate is valid only so long as the item is manufactured in conformance with the details of the approved drawings, specifications, or other data referred to. No modification in the approved design, construction, or materials is to be adopted until the modification has been presented for consideration by the Commandant and confirmation received that the proposed alteration is acceptable.

NOTICE: Where a manufacturer of safety-at-sea equipment is offering for sale to the maritime industry, directly or indirectly, equipment represented to be approved, which fails to conform with either the design details or material specifications, or both, as approved by the Coast Guard, immediate action may be taken to invoke the various penalties and sanctions provided by law including prosecution under 46 U.S.C. 3318, which provides:

"A person that knowingly manufactures, sells, offers for sale, or possesses with intent to sell, any equipment subject to this part *(Part B. of Subtitle II of Title 46 U.S.C.).* and the equipment is so defective as to be insufficient to accomplish the purpose for which it is intended, shall be fined not more than $10,000, imprisoned for not more than 5 years or both."

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APPENDIX

SECTION I
INTRODUCTION

System 3 from Siemens Industry, Inc. was developed as a flexible, wide range fire detection and control system. System 3 uses a modular concept: Only those functions desired in each system are built into that system. Any number of various input and output circuits may be custom-assembled in various size enclosures.

This manual contains information regarding only System 3 equipment and detectors that are US Coast Guard approved under Certificate No. 161.002/17/8. The use of any other equipment in systems required by US Coast Guard regulations, but not US Coast Guard approved, should only be considered when absolutely necessary. Special US Coast Guard one time approval would be required.

Drawing No. 315-085585 (Coast Guard System 3 Specification) is considered a part of this manual (See print in Appendix, page 30). In addition, the typical internal module to module wiring of two control panels is shown on pages 2 and 3 in the form of typical Wire Lists. Either a wiring list of this type or a complete point to point wiring diagram should be furnished with every system and should be kept as on-board documentation for future reference in system service and maintenance.

NOTE: When designing Fire Control Systems for various types of vessels, the designer should be aware of the required vessel type, domestic and SOLAS regulations applicable for that vessel.

WIRE LIST

9-20 **DWG E 315-085585** Sheet _____ of _____

Name **TYPICAL LARGE SYSTEM** Job No. _____ _____

	8	7	6	5	4	3	2	1
A	CP-35						PS-35	
B	ZU 35 TS	ZU 35 TS	ZU 35 TS	ZU 35 TS	ZU 35 TS	MM 35	BC-35	
C	ZU 35 TS	ZU 35 TS	ZS 30	SM 30	RM 30U	TL 30U	AE 30U	MC 30
D	SR-32		SR-32		SR-32			AE 30U
E			BK-33					

Module Space

EK - _____

CP - _____

PS - _____

JP - _____

JS - _____

JS- _____

BM - _____

No. of BP - 30

FROM	TO	FROM	TO	FROM	TO
CP-36	C3-1	B5-7	D3-36		
C3-1	C3-2	B6-1	D3-40		
C3-2	C1-1	B6-7	D3-44		
C3-3	C1-2	B7-1	D5-1		
C2-5	C1-3	B7-7	D5-4		
C1-3	CP-39	B8-1	D5-9		
P5-5	D1-1	B8-7	D5-36		
D1-1	C2-1	C8-1	D5-44		
C2-1	C4-1	C7-1	D7-1		
P5-6	D1-2	C7-7	D7-4		
D1-2	C2-2				
C2-2	C4-1				
C6-1	C5-1				
C5-1	C5-2				
C5-2	D1-5				
B2+	BATT+				
B2-	BATT-				
C8-PIN5	CP-41				
B4-1	D3-1				
B4-7	D3-5				
B5-1	D3-7				

WIRE LIST

9-20 **DWG E 315-085585** Sheet _____ of _____

Name **TYPICAL SMALL SYSTEM** Job No. _____ _____

Module Space

	8	7	6	5	4	3	2	1
A								
	CP-35						**PS-35**	
B	**ZU 35 TS**	**ZU 35 TS**	**ZU 35 TS**	**RC 30U**		**ZU 35 TS**	**ZU 35 TS**	**ZU 35 TS**
C								
D								
E								

EK - _____

CP - _____

PS - _____

JP - _____

JS - _____

JS - _____

BM - _____

No. of BP - 30

FROM	TO	FROM	TO	FROM	TO
CP-41	**BB-5**				

NOTE: RC-30U CONTROLS B6 THRU B8

SECTION II
POWER REQUIREMENTS

It is a US Coast Guard requirement that the fire detection system have two sources of power. Most large ships have both main generators and emergency generators; therefore, they can satisfy this requirement by arranging to have power supplied to the fire detection system by both the main and emergency generators.

A US Coast Guard approved Power Transfer Relay must be used for the automatic transfer from main power to secondary power when the main power source has 15% to 20% potential variation. The transfer to secondary power creates a visual and audible trouble signal on the CP-35 Control Panel. The Model PTR-1 Power Transfer Relay from Siemens Industry, Inc. has been designed for this purpose and is US Coast Guard approved.

In cases where there are no emergency generators, battery backup power to the system is required. Revised US Coast Guard regulations have reduced the required battery operation time to 36 hours for passenger ships and 18 hours for all other types of vessels. In cases where it is a desired option to furnish the fire detection system with standby battery power, even when there are main and emergency generators supplying the system, there is no specific battery operation time period, although it would be recommended to be a minimum of 18 hours.

When the smoke detection system is furnished with battery backup power, it is necessary to calculate the system power requirements to determine the battery ampere-hour capacity necessary. The calculations can be done on the Power Calculation Sheet (page 24) and the Battery Curves shown on pages 26 and 27. Another requirement involving battery power is that a voltmeter and ammeter (MM-35) are furnished. The voltmeter and ammeter are not required when the batteries are used as a third power source.

SECTION III

EQUIPMENT DESCRIPTIONS AND FUNCTIONS

1. MODULES

CP-35 MAIN CONTROL UNIT

This control unit contains system power, alarm and trouble indicating lamps, lamp test/reset, trouble and subsequent alarm silence switches, one supervised 1.5A audible alarm circuit, and two detection zones not to be used for US Coast Guard approved systems because these zones do not have alarm and trouble test switches. (See Spec Sheet Catalog No. 3060 for terminal identification.)

PS-35 POWER SUPPLY

This 10A power supply converts the 115 VAC, 60 or 50 Hz and supplies 24 VDC to all modules in the System 3 Control Panel. (See Spec Sheet Catalog No. 3061 for additional details.)

BC-35 BATTERY CHARGER MODULE

This module is required to automatically transfer power from normal power to battery power and also to charge the batteries. It can charge battery sizes up to 25 ampere-hours, and the charging capacity can be increased in increments of 25 AH to a limit of more than 100 AH by use of the BE-35; see below. (See Spec Sheet Catalog No. 3177.)

BE-35 BATTERY EXTENDER MODULE

This extender module increases the 25 AH charging capability of the BC-35 by another 25 AH when larger batteries are required, based on a 48 hour recharge period, as per ULI requirements. (See Spec Sheet Catalog No. 3177.)

MM-35 METER MODULE

This module includes the US Coast Guard required voltmeter and ammeter to display battery voltage and charging current when batteries are used as the second power source. The meters are not required when battery power is a third power source. (See Spec Sheet Catalog No. 3355.)

TC-30U BATTERY TRANSFER MODULE

This module is required to use separate ship battery power when available. Ship battery power would have its own charging method.

ZU-35TS ZONE MODULE

This module includes two detection zones with alarm and trouble LEDs, test switches, and output terminals to activate other appropriate modules or remote annunciators. It can accommodate up to thirty ionization, photoelectric, or flame detectors, or a combination thereof. The number of thermal
detectors, manual stations, and other approved contact devices that can be wired on a single zone are under practical limitations only. (See Spec Sheet Catalog No. 3107.)

ZS-30 INTRINSICALLY SAFE ZONE MODULE (See NOTE on page 15.)

This module allows certain ionization detectors, thermal detectors, and manual stations of the non-explosionproof type to be installed in hazardous areas classified as Class I, Division I, Groups A, B, C, and D. A diode shunt barrier is required outside the hazard area to limit the energy in the event of equipment failure. Only ten Model DI-3IS Ionization Detectors or five Model S-121/122 Flame Detectors, and any number of approved thermal detectors or manual stations, can be connected to this single zone module. (See Spec Sheet Catalog No. 3105.)

Note: Unlike the ZU-35TS, this single zone module does not have its own zone alarm and trouble test switches. Therefore, it is necessary to use an SM-30 switch module alongside the ZS-30 to satisfy this test capability requirement.

RC-30U CONFIRMATION MODULE

This module is designed to reduce unwanted alarms from the momentary presence of products of combustion — low ceiling heights where smoking is allowed, for example. It records the first alarm from zones under its control, but does not put the control panel into the alarm mode unless the detector response is repeated within 1 minute (time adjustable) or less. (See Spec Sheet Catalog No. 3167.)

AE-30U ALARM EXTENDER MODULE

This module is used whenever the total alarm device power exceeds the supervised 1.5A alarm circuit that is included in the CP-35, or where separate alarm circuits are required. Each AE-30U offers another supervised 1.5A, and AE-30U modules can be used in whatever multiples are required. (See Spec Sheet Catalog No. 3129.)

MC-30 MASTER CODE MODULE

This module is designed to provide a pulse (120/minute) on the audible and visible signal devices. It is capable of controlling up to three audible signal circuit AE-30U modules. (See Spec Sheet Catalog No. 3163.)

ZN-31U CONTACT MODULE

See Spec Sheet Catalog No. 3108.

ZN-34UA, ZN-34US INPUT MODULES

These modules are designed to provide two circuits for the supervision of sprinkler system gate valves and ancillary equipment in accordance with NFPA Standard 72. The modules provide two yellow LED indicators per circuit. The first illuminates when a supervisory condition exists and the second when a circuit trouble condition occurs. The module utilizes an end-of-line resistor in parallel with normally open switches to provide this supervision. (See Spec Sheet Catalog No. 3111.)

2. SUPPLEMENTARY MODULES

SR-30 RELAY MODULE

This module has two SPST relays with 3A contacts. (See Spec Sheet Catalog No. 3121.)

SR-32 RELAY MODULE

This module has six DPDT relays with 3A contacts. (See Spec Sheet Catalog No. 3125.)

SR-35 RELAY MODULE

This module has eight SPDT relays with 2A contacts. (See Spec Sheet Catalog No. 3130.)

TL-30U TIME LIMIT MODULE

This module is designed to provide any required timing function (time in or time out) with field adjustment possible between 1 second and 10 minutes. (See Spec Sheet Catalog No. 3166.)

SM-30 SWITCH MODULE

This module provides two manual on/off switches that can be used for any desired purpose. The switches put the system into a trouble condition and use LED trouble lights to identify which switches are switched to off-normal. (See Spec Sheet Catalog No. 3162.)

PM-31 and PM-32 PROGRAM MATRIX MODULES

These two modules are designed to provide complex supplementary control that would be difficult to arrange with relays. (See Spec Sheet Catalog No. 3169.)

RM-30U and RM-30RU RELEASE MODULES

These modules are designed to provide a supervised 1.5A release circuit for damper release or similar functions. They both have a 24 VDC output, but the RM-30RU includes three series resistors that can adjust for 6, 12, 18, or 24 VDC resistance. (See Spec Sheet Catalog No. 3162.)

DM-31 DISTRIBUTION MODULE

This module is a terminal strip for use when multiple enclosures are required on large systems. (See Drawing 515-021941 in Appendix.)

AD-30S SUPERVISED ANNUNCIATOR DRIVER

This module is designed to be installed with other modules in the System 3 Control Panel. The AD-30S is a supervised annunciator driver module which will supervise groups of 8 indicators and the wires going to these indicators. If you required 1 supervised, 8-zone annunciator, you would require 1 AD-30S. However, if you required a 24 zone supervised annunciator, then 3 AD-30Ss would be needed to drive the annunciator.

3. ENCLOSURES

EA-32, EA-33, and EA-35 ENCLOSURE

The selection of the required number of modules for a given system determines the necessary enclosure size. The enclosure model number indicates the number of module rows: the EA-32 has two, the EA-33 has three, and the EA-35 has five. Each module row contains eight module spaces, but some modules require more than one space. On large systems it may be desirable or necessary to use more than one enclosure. This can be accomplished through the use of the DM-31 distribution module, which is used as a terminal strip.

SHOCK MOUNTING FOR ENCLOSURES

All enclosures should be shock mounted and drip proof with an upper door shroud and Lexan window lenses. A US Coast Guard approval nameplate must be affixed to the door. (See Spec Sheet Catalog No. 3325 for sizes and dimensions and pages 8-9 for shock-mount and drip-proof shroud installation.)

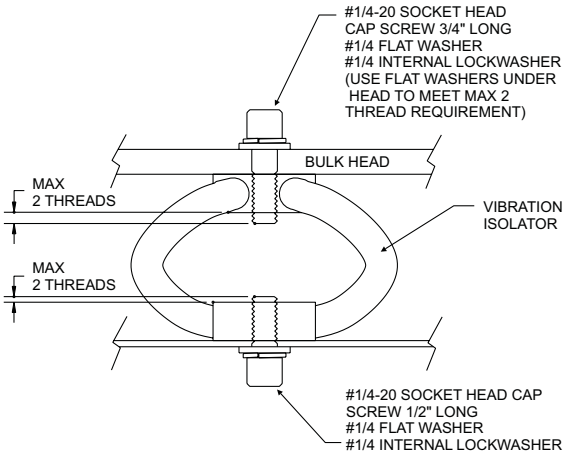
ASSEMBLY INSTRUCTIONS FOR COAST GUARD MOUNTING KIT VIK-1

1. On the Table on page 9 locate the enclosure model to be installed. Determine the number of isolators to be used and the distance between the isolator centers.
2. Mark isolator centers to be used on the bulkhead and draw perpendicular lines through each of the centers.
3. Drill 5/16 inch clearance holes into bulk-head. Mount isolator to bulkhead with 1/4-20x3/4" cap screw, washer and lockwasher. Tighten to 13 ft-lbs of torque. Refer to the stud assembly illustration (Figure 1, page 9) for the proper hardware sequence.
4. Mount the enclosure to the isolators (Refer to the Mounting Diagram, Figure 2, page 9) with 1/4-20x1/2" cap screw, washer and lockwasher. Tighten to 13 ft-lbs of torque.

NOTES: Flexible conduit or cable with a maximum diameter of 3/4 inch and a minimum length of 18 inches from a rigid connection should be used to house external wiring.

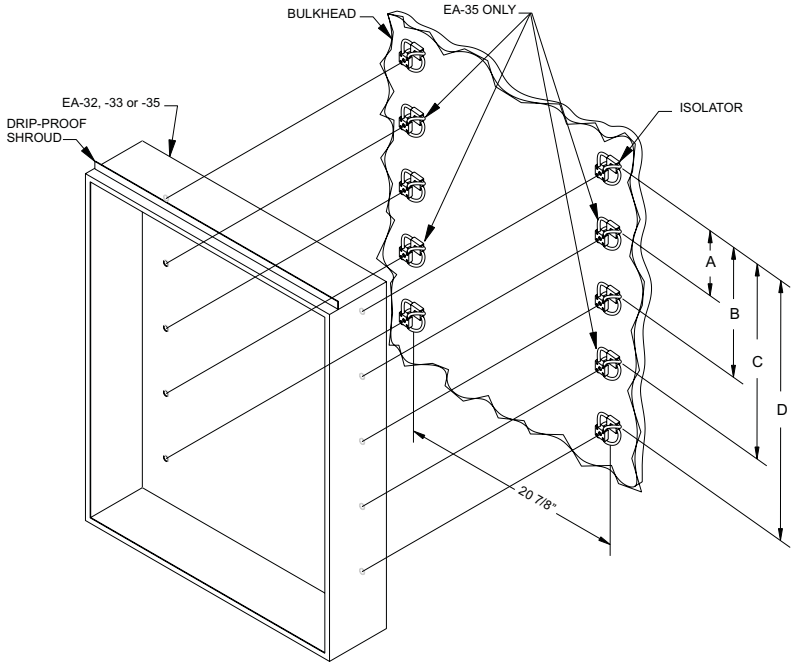
PTR-1 POWER TRANSFER RELAY

The PTR-1 is an automatic power transfer relay that transfers power from the main generators, at a 15% to 20% potential reduction, to the backup generators. This automatic transfer creates an audible and visual system trouble signal. The PTR-1 is in its own enclosure. (See Appendix for PTR-1 Connections, Cover, and Enclosure.)



Note:
The VIK-1 Kit can only be used on bulkheads with a thickness of no greater than 5/16 inch.

Figure 1
VIBRATION ISOLATOR DETAIL: COAST GUARD APPLICATION



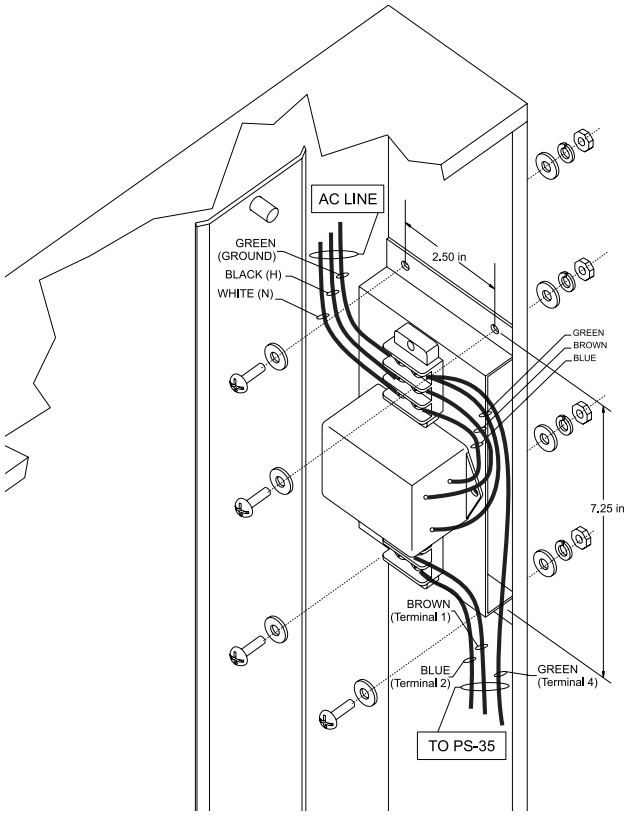
Note:
1. Prior to mounting enclosure EA-35, drill four new 5/16 inch diameter holes located vertically at the A and C dimensions, in addition to redrilling the existing mounting holes to 1/2 inch.

ENCLOSURE SIZE	CENTER DISTANCE (INCHES)				NO. OF ISOLATOR KITS REQUIRED
	A	B	C	D	
32	—	—	—	20 ½	4
33	—	15 ½	—	31	6
35	13	26	39	52	10

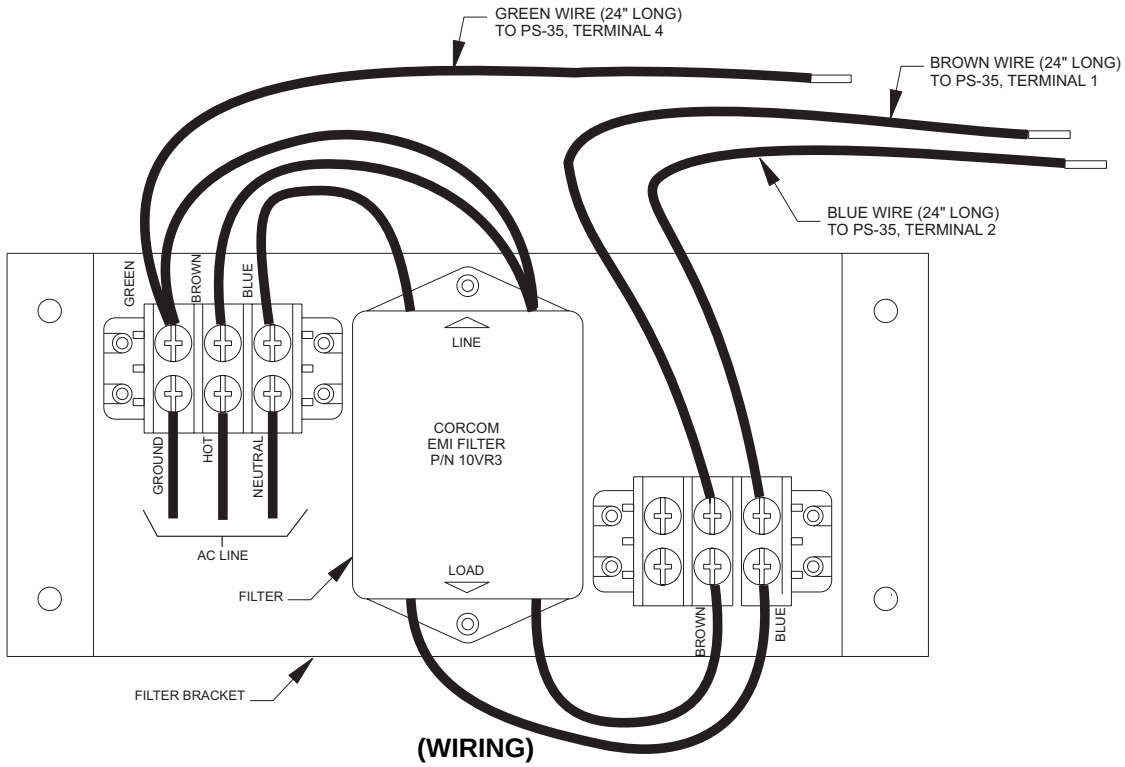
Figure 2
MOUNTING DIAGRAM FOR EA-32, -33, AND -35 ENCLOSURES FOR COAST GUARD APPLICATION

INSTALLING THE CGFK-1 FILTER KIT

1. Using the bracket as a template, hold the bracket up against the upper right-hand side of the enclosure, close to where the PS-35 is mounted. (Refer to Figure 3-Mounting.)
2. Mark the location of the four holes in the bracket on the side of the enclosure.
3. Drill four 0.18" diameter holes in the locations marked on the side of the enclosure.
4. Mount the bracket assembly using the #8-32 screws, flat washers, lock washers and nuts as shown in Figure 3-Mounting.
5. Insert the AC line wires into the positions shown in Figure 3-Wiring.
6. Snap the terminal block covers into place.
7. Connect the filter load wires from the filter to the PS-35 terminal block as shown in Figure 3-Wiring.



(MOUNTING)



(WIRING)

Figure 3
INSTALLING THE CGFK-1 FILTER KIT

4. REMOTE ANNUNCIATION

RL REMOTE ALARM LAMPS SERIES

This series of remote alarm lamps was designed to offer fast and convenient identification of any detectors that release alarms within concealed spaces such as staterooms, store rooms, lockers, etc. The RL-30 and RL-40 models are used as remote individual detector alarm lamps on round or rectangular switch boxes, respectively. The RL-6 can accommodate up to four detectors with one common remote indication. (See Spec Sheet Catalog No. 8011 and No. 8013.)

RLP REMOTE LAMP PANELS SERIES

The RLP-4, -8, and -12, with 4, 8, and 12 lamps, respectively, serve the same purpose as the individual remote alarm lamps, except that they are mounted on a common panel. (See Spec Sheet Catalog No. 8012.)

5. AUDIBLE ALARMS

ALARM LOCATIONS AND REQUIREMENTS

Ten inch bells are required to sound in the following locations when any alarm initiating device is actuated.

1. Alarm bell must always sound on the bridge regardless of which zone is in alarm.

2. Alarm bells must sound in the engine room, machinery spaces, and the control room when the alarm is initiated in any of these spaces. In case the control room might be unattended at the time of alarm, bells must also be installed in the passageways and lounge areas of the licensed engineer's quarters.

3. If an alarm is not acknowledged (silenced or reset) at the control panel within 2 minutes, the control panel must automatically cause the General Alarm to sound.

NOTE: If it should be necessary to supplement the 10 inch bell audible output in high noise background areas with horns, sirens, strobes, flashing or rotating lights, the wiring to such supplementary alarm devices does not have to be supervised. However, audible alarms other than bells must always be accompanied by lights or strobes.

BT-F and BT-SS Bells

The BT-F and BT-SS are vibrating and single stroke 10-inch bells. (See Spec. Sheet Catalog No. 2537.)

SUMMARY OF AUDIBLE ALARMS*

Model Number	Min. dB Level@10 Ft.	Current Draw@24VDC	Normal Limit Per Circuit
BT-F	84.4	288mA	5
BT-SS	74.7	318mA	4
HN-EP	82	65mA	23
HNH-EP	92	350mA	4
U-EC(-W)	68.1	19mA	78
U-EC-MCS(-W)			
Chime only	92	19mA	78
15cd Strobe only		82mA	18
30cd Strobe only		107mA	14
75cd Strobe only		182mA	8
110 Strobe only		234mA	6
Chime/15cd Strobe	92	101mA	14
Chime/30cd Strobe	92	126mA	11
Chime/75cd Strobe	92	201mA	7
Chime/110cd Strobe	92	253mA	5
U-HN(-W)	80.4	49mA	30
U-HN-MCS(-W)			
Horn only	80.4	49mA	30
15cd Strobe only		82mA	18
30cd Strobe only		107mA	14
75cd Strobe only		182mA	8
110 Strobe only		234mA	6
Horn/15cd Strobe	92	131mA	11
Horn/30cd Strobe	92	156mA	9
Horn/75cd Strobe	92	231mA	6
Horn/110cd Strobe	92	283mA	5
U-HNH(-W)	82.6	70mA	21
U-HNH-MCS(-W)			
Horn only	82.6	70mA	21
15cd Strobe only		82mA	18
30cd Strobe only		107mA	14
75cd Strobe only		182mA	8
110 Strobe only		234mA	6
Horn/15cd Strobe	92	152mA	9
Horn/30cd Strobe	92	177mA	8
Horn/75cd Strobe	92	252mA	5
Horn/110cd Strobe	92	304mA	4
U-MH(-W)			
Steady	79.2	18mA	83
Temporal	75.9	16mA	93
U-MH-1G(-W)			
Steady	79.2	18mA	83
Temporal	75.9	16mA	93
U-MH-MCS(-W)			
Horn only	79.2	18mA	83
15cd Strobe only		82mA	18
30cd Strobe only		107mA	14
75cd Strobe only		182mA	8
110 Strobe only		234mA	6
Horn/15cd Strobe	92	100mA	15
Horn/30cd Strobe	92	115mA	13
Horn/75cd Strobe	92	200mA	7
Horn/110cd Strobe	92	252mA	5
U-MHT(-W)			
Steady	79.2	18mA	83
Temporal	75.9	16mA	93
U-MHT-MCS(-W)			
Horn only	79.2	18mA	83
15cd Strobe only		82mA	18
30cd Strobe only		107mA	14
75cd Strobe only		182mA	8
110 Strobe only		234mA	6
Horn/15cd Strobe	92	100mA	15
Horn/30cd Strobe	92	115mA	13
Horn/75cd Strobe	92	200mA	7
Horn/110cd Strobe	92	252mA	5

Model Number	Min. dB Level@10 Ft.	Current Draw@24VDC	Normal Limit Per Circuit
U-MMT(-W)			
Horn	80.4	53mA	28
Chime	73.9	53mA	28
Bell	74	52mA	28
SI Whoop	77.8	67mA	22
Temporal	76.2	38mA	39
Siren	78.5	67mA	22
Hi-Lo	78.6	38mA	39
SS Bell	71.1	44mA	34
U-MMT-1G(-W)			
Horn	80.4	53mA	28
Chime	73.9	53mA	28
Bell	74	52mA	28
SI Whoop	77.8	67mA	22
Temporal	76.2	38mA	39
Siren	78.5	67mA	22
Hi-Lo	78.6	38mA	39
SS Bell	71.1	44mA	34
U-MMT-MCS(-W)			
Horn only	80.4	53mA	28
Chime only	73.9	53mA	28
Bell only	74	52mA	28
SI Whoop only	77.8	67mA	22
Temporal only	76.2	38mA	39
Siren only	78.5	67mA	22
Hi-Lo only	78.6	38mA	39
SS Bell only	71.1	44mA	34
15cd Strobe only		82mA	18
30cd Strobe only		107mA	14
75cd Strobe only		182mA	8
110 Strobe only		234mA	6
Horn/15cd Strobe	80.4	135mA	11
Horn/30cd Strobe	80.4	160mA	9
Horn75cd Strobe	80.4	235mA	6
Horn/110 Strobe	80.4	287mA	5
Chime/15cd Strobe	73.9	135mA	11
Chime/30cd Strobe	73.9	160mA	9
Chime75cd Strobe	73.9	235mA	6
Chime/110 Strobe	76.9	287mA	5
Bell/15cd Strobe	74	134mA	11
Bell/30cd Strobe	74	159mA	9
Bell/75cd Strobe	74	234mA	6
Bell/110 Strobe	74	286mA	5
SI Whoop/15cd Strobe	77.8	149mA	10
SI Whoop/30cd Strobe	77.8	174mA	8
SI Whoop/75cd Strobe	77.8	249mA	6
SI Whoop/110 Strobe	77.8	301mA	4
Temporal/15cd Strobe	76.2	120mA	12
Temporal/30cd Strobe	76.2	145mA	10
Temporal/75cd Strobe	76.2	220mA	6
Temporal/110 Strobe	76.2	272mA	5
Siren/15cd Strobe	78.5	149mA	10
Siren/30cd Strobe	78.5	174mA	8
Siren/75cd Strobe	78.5	249mA	6
Siren/110 Strobe	78.5	301mA	4
Hi-Lo/15cd Strobe	78.6	120mA	12
Hi-Lo/30cd Strobe	78.6	145mA	10
Hi-Lo/75cd Strobe	78.6	220mA	6
Hi-Lo/110 Strobe	78.6	272mA	5
SSBell/15cd Strobe	71.1	126mA	11
SSBell/30cd Strobe	71.1	151mA	9
SSBell/75cd Strobe	71.1	226mA	6
SSBell/110 Strobe	71.1	278mA	5

*When audible alarms other than required bells are used, they must be accompanied with a visual fire signal either incorporated in the horn enclosure or separate strobes.

Any combination of the approved notification devices can be used, but the combination cannot be greater than the circuit current of 1.5A.

6. INITIATING DEVICES— AUTOMATIC

DI-3

Ion detector— limit of thirty per zone. (See Spec Sheet Catalog No. 6119.)

DI-3IS

This ion detector is for intrinsically safe applications when used with the ZS-30 module with diode shunt barrier. There is a limit of ten detectors per zone circuit. (See Spec Sheet Catalog No. 6119.)

DT-C Series

The DT-135CS and DT-200CS thermal detectors are the rate compensated type available in 135° F and 200° F settings. The DT-135CL and the DT-200CL are identical to CS versions, except that they have an internal alarm indicating lamp. There is a practical limit only to the number per zone. (See Spec Sheet Catalog No. 6131.)

DT-11 Thermal Detector

The DT-11 is a thermal detector for use in open areas. It uses the DB-11 low profile surface mounting base or the DB-3S base with the DB-ADPT adapter. (See Spec Sheet Catalog No. 6174.)

DT-135/200 WP

This weatherproof thermal detector has a rate compensated principal available in either a 135° F or 200° F setting. The detector is epoxy coated and mounts to a weatherproof box for approved use in wet or unsheltered locations. (See Spec Sheet Catalog No. 6127.)

DT-140/190 EP

This explosionproof thermal detector has a rate compensated principle available in either a 140° F and 190° F setting. It should be used in hazardous areas requiring explosionproof devices. The detector mounts to an approved explosionproof junction box. (See Spec Sheet Catalog No. 6128.)

PE-11 Photoelectric Detector

The PE-11 is a photoelectric detector that responds to a wide range of both flaming and smoldering fire conditions. It uses the DB-11 low profile surface mounting base, the DB-3S base with the DB-ADPT adapter, or the AD-11P/PR air duct housing. (See Spec Sheet Catalog No. 6173.)

PE-11T Photoelectric Detector with Heat Sensor

The PE-11T is a photoelectric detector with heat sensor that responds to a wide range of both flaming and smoldering fire conditions. It uses the DB-11 low profile surface mounting base or the DB-3S base with the DB-ADPT adapter. (See Spec Sheet Catalog No. 6173.)

6.1 BASE SEAL for DB-3S or DB-11 BASE

Use the DB-Seal with a DB-3S base or the DB-11 Seal with a DB-11 base to prevent moisture from condensing and collecting on the rear of the detector used. This moisture can occur when units experience different temperatures or humidity conditions.

INSTALLING the DB-SEAL for DB-3S BASE

(See Figure 4)

All wiring must comply with national and local codes.

1. Install and wire the DB-3S base by following the DB-3S Installation Instructions (P/N 315-083225). Make sure that all wires are dressed flush to the bottom of the base.
2. Position the tabs on the seal over the slots in the inner rim of the base and press the seal in place.
3. Check that the four openings for the spring contacts clear the springs and the plastic terminal supports.
4. With the seal in place, install the detector.
5. Follow the checkout procedure in the detector installation instructions.

INSTALLING the DB-11 SEAL for DB-11 BASE

(See Figure 5)

All wiring must comply with national and local codes.

1. Install and wire the DB-11 base by following the DB-11 Installation Instructions (P/N 315-094193). Make sure that all wires are dressed flush to the bottom of the base.
2. Place the base seal (1/4" white foam) firmly into the bottom of the base. Do not cover the contact springs (See Figure 5.)
3. Rotate the detector counterclockwise while pressing on it until the detector drops into the base.
4. Rotate the detector clockwise until it stops and locks in place.

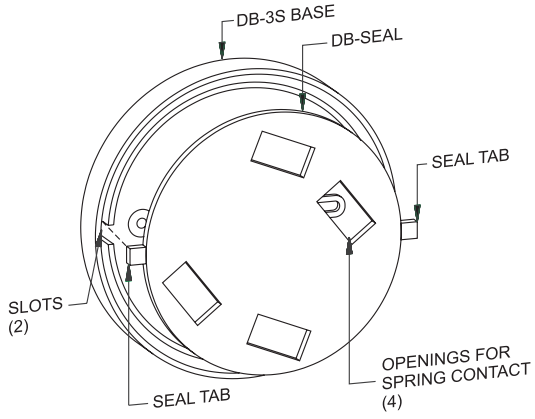


Figure 4
Installing the DB-Seal

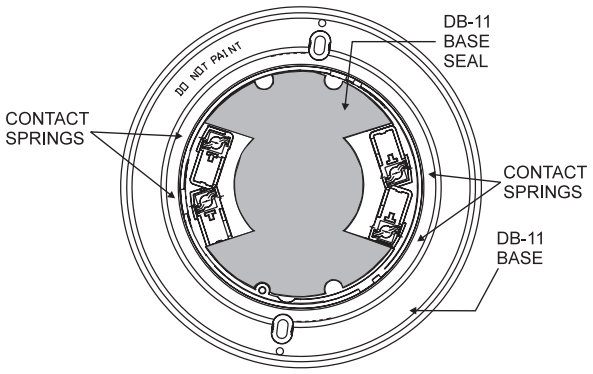


Figure 5
Installing the DB-11 Seal

7. INITIATING DEVICES — MANUAL

MS-51/501

Manual fire alarm station. Manual stations are recommended for use with automatic fire detectors. If a fire is observed before automatic detector response, the manual activation of the station results in the same system response as automatic detection. Manual stations should be installed throughout the accommodation spaces, the service spaces, and the control stations. One manual station should be located at each exit. The stations should be readily accessible in the corridors of each deck so that no part of the corridor is more than 60 feet (20 meters) from another manual station. (See Spec Sheet Catalog No. 6183.)

MSM Series

The MSM Series manual stations feature a rugged diecast metal housing that satisfies both architectural and code requirements for manual fire alarm box initiation devices. The MSM-Series box features keyed reset using the same key as the control panels.

The MSM Series models are low-profile with all surfaces either painted or plated to inhibit corrosion. These boxes have raised lettering and are shipped with two reset keys and a break glass rod (use of rod is optional.) Options include: double action, institutional, weatherproof, and explosion-proof. (See Spec Sheet Catalog No. 6184.)

SECTION IV
CONTROL PANEL CONFIGURATION

After the type and quantity of modules required to satisfy a given system are determined, the arrangement of the modules in the enclosure(s) should be planned. For consistency, the CP-35 control unit must always be located in the left side of the top row, with the PS-35 on the right side of the row to fill the entire top row.

If the system does not require battery backup, the remaining modules can be located as desired, except for the RC-30U, as the others are not placement sensitive. If battery backup is to be included, the BC-35 battery charger module must always be placed to the right side of the second row. Should one or more BE-35 battery extender modules be required, they must be placed to the left of the BC-35. The BE-35 extends the 25 AH charging capability of the BC-35 by another 25 AH up to a final capability of more than 100 AH. The MM-35 meter module should then be placed to the left of the BC-35 or next to the last BE-35. The remaining modules can be placed as desired.

SECTION V
DETECTOR APPLICATION AND SPACING

1. SMOKE DETECTORS

1.1 DESCRIPTION AND FUNCTION

Smoke detector is the generic name given to either ionization type or photoelectric type detectors. The ionization type responds to both visible and invisible products of combustion, while the photoelectric type depends on sensing visible smoke.

1.2 SPACING

For average areas with smooth ceilings and normal air movement, the maximum recommended spacing is 900 square feet or no more than 30 feet between centers and 15 feet from a sidewall. In areas with higher air movement, the detector spacing should be reduced accordingly.

1.3 APPLICATION LIMITATIONS

1.3.1 On ceiling heights below 8 feet, the possibility of unintentional alarms from tobacco smoke does exist, especially in areas where people might congregate. It is recommended that smoke detectors in such areas have their zones wired through the RC-30U alarm confirmation module.

1.3.2 Smoke detectors should not be used in areas where they could be subjected to steam or moisture condensation such as in galleys, laundries, etc. Thermal detectors should be used in such areas.

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2. THERMAL DETECTORS

2.1 DESCRIPTION AND FUNCTION

All thermal detectors respond only to excessive heat, which is assumed to be generated from a flaming fire. The detectors are designed with different operating principles as described below.

2.1.1 Fixed Temperature

The air temperature has to exceed the set ratings of the devices in order to activate it. The settings are 135° F, 190° F, and higher (on special order).

2.1.2 Rate Compensated

This type of thermal detector is similar to the fixed temperature detector in operation, but is compensated to eliminate the expected thermal lag and, therefore, responds faster.

2.2 SPACING

Maximum approved spacing of thermal detectors is as follows:

Type	Area Protected (Square Feet)	Maximum Distance from Sidewalls (Feet)
Fixed Temperature (DT-11)	625 (25 X 25)	12.5
Fixed and Rate of Rise	2500 (50 X 50)	25
DT-135 CS, CL, and WP Rate Compensated	2500 (50 X 50)	25
DT-200 CS, CL and WP Rate Compensated	2500 (50 X 50)	12.5

3. PLANNING A FIRE DETECTION SYSTEM

When planning a fire detection system, make a choice of detector based on the kinds of fires expected. The type and quantity of fuel, possible ignition sources, ranges of ambient conditions, and the value of the property to be protected should all be considered.

In general, heat detectors have the lowest cost and false alarm rate, but are the slowest to respond. Since the heat generated by small fires tends to dissipate fairly rapidly, heat detectors are best used to protect confined spaces, or directly over hazards where flaming fires can be expected. They are usually installed on a grid pattern at their recommended spacing distances or at reduced spacing for faster response. The operating temperature of a heat detector should be at least 25° F above the maximum expected ambient temperature in the area protected.

Smoke detectors cost more than heat detectors, but respond faster to fires. They are better suited to protect large open spaces than heat detectors because smoke does not dissipate as rapidly as heat does in the same size space. Smoke detectors are either installed according to prevailing air current conditions or on a grid layout.

Photoelectric smoke detectors are best used in places where wire insulation or other smoldering fires may be expected. Ionization smoke detectors are useful where fire would be expected to develop into a small flaming condition soon after pyrolysis.

Flame detectors offer extremely fast response, but warn of any source of radiation in their sensitivity range. False alarm rates can be high if this kind of detector is improperly applied. Because flame detectors are “line of sight” devices, care must be taken to ensure that they can see the entire protected area and that they will not be accidentally blocked by stacked material or equipment. Their sensitivity is a function of flame size and distance from the detector. Although fairly expensive, they are well-suited to protect areas where explosive or flammable vapors or dusts are encountered because they are usually available in explosionproof housings or have intrinsically safe ratings.

NFPA 72 Annex A (2002 Edition) has more specific information on the installation of the various types of detectors.

3.1 DETECTOR APPLICATION

In view of the problems that can be expected with the misapplication and location of detection devices aboard ship, the guidelines below should be followed when designing systems.

These tables list situations where the use of smoke detectors, ionization and photoelectric should be avoided.

MOISTURE	
Salt water spray	Heat treating
Corrosive atmospheres	Dust or lint
Water spray	Sawing, drilling and grinding
Live steam	Pneumatic transport
Steam tables	
Showers	
Humidifiers	
Slop sinks	
Humid outside air	
Excessive tobacco smoke	
COMBUSTION PRODUCTS AND FUMES	
Cooking equipment	Engine exhaust
Ovens	Gasoline forklift trucks
Dryers	Diesel trucks and locomotives
Exhaust hoods	Engines not vented to the outside
Metal cutting	Welding and brazing
Machining	Heating element, abnormal
Paint spray	Dust accumulation
Curing	Improper exhaust systems
Chemical fumes	Incomplete combustion
Cleaning fluids	

Conventional photoelectric/ionization detectors shall not be installed in cargo holds and RO/RO spaces.

NOTE: Conventional weatherproof thermal detectors DT-135WP/DT-200WP must be used in cargo holds and RO/RO spaces.

Areas to be Protected	Monitoring Machinery Spaces
— *ACCOMMODATION SPACES (ION, PHOTO)* Halls, dining rooms, lounges, and other areas of this type with permanent walls, corridors, sanitation facilities, cabins, offices, infirmaries, and leisure rooms not containing cooking appliances. — *SERVICE AREAS (ION, PHOTO, TEMP)* Service cabinets, radio rooms, strongrooms, stores, workshops other than machinery spaces, and similar areas, including shafts going to them, as well as life-vest storage areas. — *SPECIAL AREAS (ION, PHOTO, TEMP)* Closed areas for transport of special materials. — *SAFETY STATIONS (ION, PHOTO, TEMP)* Areas housing the radio equipment, major navigation equipment, standby generator and central installations. — *MACHINERY SPACES (ION, PHOTO, TEMP)* Areas housing the propulsion unit, boilers, liquid-fuel handling units, stabilization equipment, ventilation and air conditioning equipment, and similar areas, including the shafts running to them.	Because of the irregular shape of most machinery spaces and the strong air currents present, the number and type of detectors used cannot be based on the area protected, as is in the common practice on land-based installations and ship accommodation spaces. The best design approach is to pick out all potential fire outbreak areas and place a fire detector above each of them at deck level. Areas of potential fire risk include the following: — Auxiliary boiler front — Main boiler front — Fuel oil pressure pumps — Auxiliary generator sets — Main diesel engine fuel oil pumps and injectors — Fuel oil purifiers — Lubricating oil purifiers — Fuel oil transfer pumps — Workshops — Electrical switchboards — Storerooms Locate additional detectors with fairly wide spacing to give general cover to areas not containing special risk.

4. DETECTOR INSTALLATION

After the most suitable detector for the job is selected, the location of the detector within the space to be protected should be considered.

Spot type detectors are usually located on the ceiling or side wall with the edge of the detector located no closer than 4 inches from the wall or ceiling. When heat detectors are installed at their listed spacing, detection times are approximately equivalent to the operating time of standard 165° F link-and-lever sprinklers. If faster response is desired, reduce detector spacing. Also, where ceiling heights exceed 16 feet, or where ceiling construction is not smooth, reduce spacings accordingly. Specific information on the treatment of joisted, beamed, and sloped ceilings can be found in Annex A of NFPA 72 (2002 Edition).

When installing any type of heat detector, consideration should be given to sources of heat within the protected space which might cause false alarms. For example, locate heat detectors away from unit heaters and ovens where surges of hot air might be expected.

The installation of smoke detectors is more critical than for heat detectors because smoke transport is strongly influenced by the convective air flow patterns within the protected area. For this reason, smoke detectors are not assigned a listed spacing by the testing laboratories other than a maximum area coverage of 900 square feet per detector. Although a grid pattern can be used as a starting point, care must be taken to appropriately locate the heating supply registers and return air registers. Smoke detectors should be located away from turbulence caused by hot air outlets. The location of the smoke detectors should favor return air because the return air draws smoke toward the detector and because air velocity at the return tends to be lower.

Smoke stratification also should be considered when smoke detectors are installed. Smoke may stratify below a ceiling due to temperature gradients or air flow along the ceiling. When stratification is a possibility, smoke detectors can be installed with alternate detectors at different levels.

The installation of ionization type detectors is similar to that of smoke detectors since fire gases tend to flow with smoke and are similarly affected by convected flows within the protected space. They also must be located away from sources of oxidizable gases or vapors; for example, away from substances like aerosol sprays or hydrocarbon solvents, as these substances could cause false alarms.

5. SYSTEM MAINTENANCE AND TESTING

All fire detection systems should be periodically tested in a manner that ensures at least one annual check of all associated detectors and devices. The most effective way to perform this system test is to check one-twelfth of the number of initiating devices monthly. This results in an automatic monthly test of the control panel, alarm devices, and other associated equipment.

More than just testing detectors for alarm release, ionization and photoelectric-type detectors should have their sensitivity settings measured to assure a proper range. All types of detectors should be cleaned whenever there is evidence of dirt or other contamination.

The System 3 Control Panel from Siemens Industry, Inc. incorporates automatic supervision of any open circuit or ground fault in all external wiring. Either condition results in a system audible and visual trouble signal. Open circuits are further identified by the LED on either the zone or the audible alarm module in which they exist. A ground fault, in addition to initiating a system trouble, identifies itself with its own indicating LED. To locate and correct the ground fault, each external circuit is systematically opened until the fault signal is cleared. The ground is then found in that particular circuit.

System 3 zone modules (ZU-35TSs) include manual momentary contact zone alarm and zone trouble test switches that simulate an alarm or trouble condition when actuated. However, this type of testing does not assure proper detector performances and does not serve that purpose.

For more detailed troubleshooting and maintenance information, refer to the System 3 Installation and Maintenance Manual, P/N 315-085063. For service assistance, call the Siemens Industry, Inc. offices or Authorized Distributor listings found in the Yellow Pages.

SECTION VI

POWER CALCULATIONS

1. POWER CALCULATION SHEET

The Power Calculation Sheet on the following page lists the supervisory and alarm current requirements of the System 3 equipment and modules and can be used to determine the power needs of a specific system configuration.

POWER CALCULATION SHEET

MODULE	QUANTITY	SUPERVISORY (mA)		ALARM (mA)	
CP-35	_____	150	_____	260[1]	_____
CP-35/BC-35	_____	195	_____	290[1]	_____
BE-35	_____	60	_____	—	_____
AD-30S	_____	4/lamp	_____	50/lamp	_____
AE-30U	_____	6.5	_____	40	_____
MC-30	_____	0	_____	15	_____
RC-30U	_____	5	_____	40	_____
RM-30U/30RU	_____	4	_____	1600	_____
SR-30/32/35	_____	0	_____	45/relay[2]	_____
SM-30	_____	0	_____	45[3]	_____
TC-30U	_____	30	_____	15	_____
TL-30U	_____	0	_____	45	_____
ZS-30	_____	50[4]	_____	100	_____
ZU-35TS	_____	9/zone[4]	_____	110/zone[5]	_____ [6]
SUBTOTALS (**a** and **b**)		**a**	_____	**b**	_____
Notification Appliances	_____	0		**c**	_____ [7]

TOTAL POWER REQUIREMENTS (**a** + **b** + **c**) _____ [8]

1 — Includes the CP-35 audible circuit.
2 — Use the highest number of relays that will be operated when either a) any three zones, or b) 10% of the total zones are in alarm.
3 — Only when switch is operated.
4 — All zones must have supervisory current calculated.
5 — Minimum of three zones or 10% of total zones must be calculated. In zones with shorting devices (thermals, MSs, etc.), add 120mA.
7 — Notification appliance alarm current draw.
8 — Total alarm current cannot exceed 10A when using the PS-35.

2. DETERMINING CURRENT REQUIREMENTS FOR A GIVEN SYSTEM CONFIGURATION

a. Following the format of the Power Calculation Sheet above, list the correct quantity for each type of equipment included.

b. Multiply the supervisory and alarm currents shown for each item by the number of modules included, and list the total module alarm currents in the appropriate columns.

c. Add the two columns and record the subtotals where indicated **(a** and **b).**

d. The current requirements of the audible devices must also be calculated, based on number and type used. Fill Blank **c** in with the amount of current needed for the audible devices included.

e. Add the current subtotals **(a** and **b)** to the audible devices current requirements **(c)** to obtain the **TOTAL** current necessary for the system. Enter that amount opposite **TOTAL.**

3. BATTERY BACKUP POWER

The US Coast Guard requires that two sources of power be available to the smoke detection system. Usually this will be the main and standby generators. Present requirements for battery power as a second source call for 36 hours for passenger ships and 18 hours for all other ships. When battery backup is optionally used in addition to main and standby generators, there is no operation time requirement, but 18 hours would be recommended.

System 3 equipment includes two compatible battery modules:

BT-33 5 AH Battery Module
BT-34 10 AH Battery Module

Batteries of 28 AH are also compatible with System 3 systems, Model No. BTX-1. (See Spec Sheet Catalog No. 3361.)

The following battery load curves show alarm and supervisory current available from 5 AH, 10 AH, and 28 AH batteries for 24 hour supervisory current and 5 minute alarm current capabilities. The supervisory current is represented on the vertical axis in milliamps, and the alarm current, on the horizontal axis in amps.

CHART A
5 AH Rated Capacity at 20 Hour Rate

Allowable Supervisory and Alarm Currents
For Standby Periods of 18 Hours and 36 Hours
Alarm Duration 5 Minutes

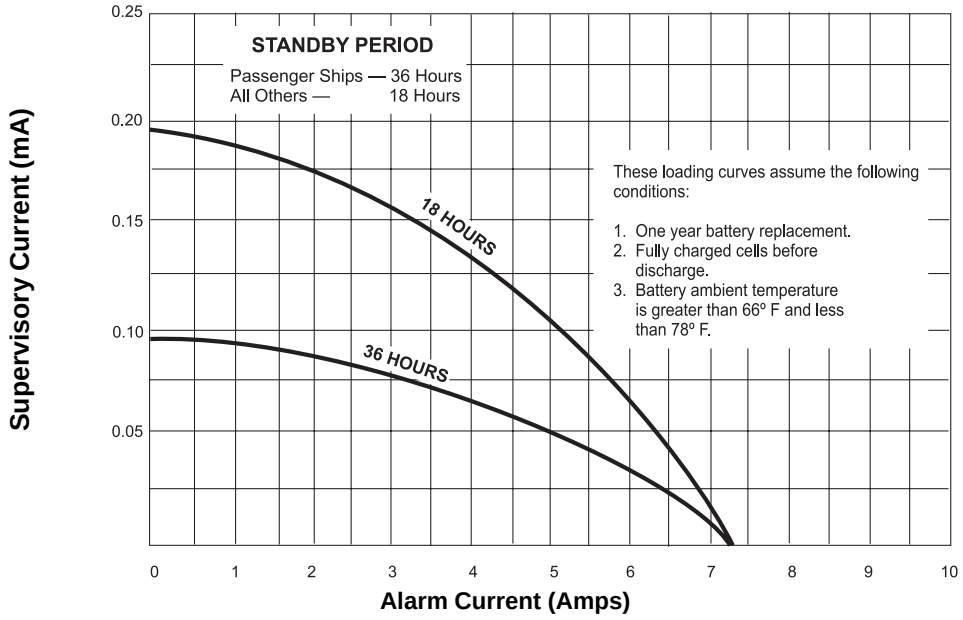


CHART B
10 AH Rated Capacity at 20 Hour Rate

Allowable Supervisory and Alarm Currents
For Standby Periods of 18 Hours and 36 Hours
Alarm Duration 5 Minutes

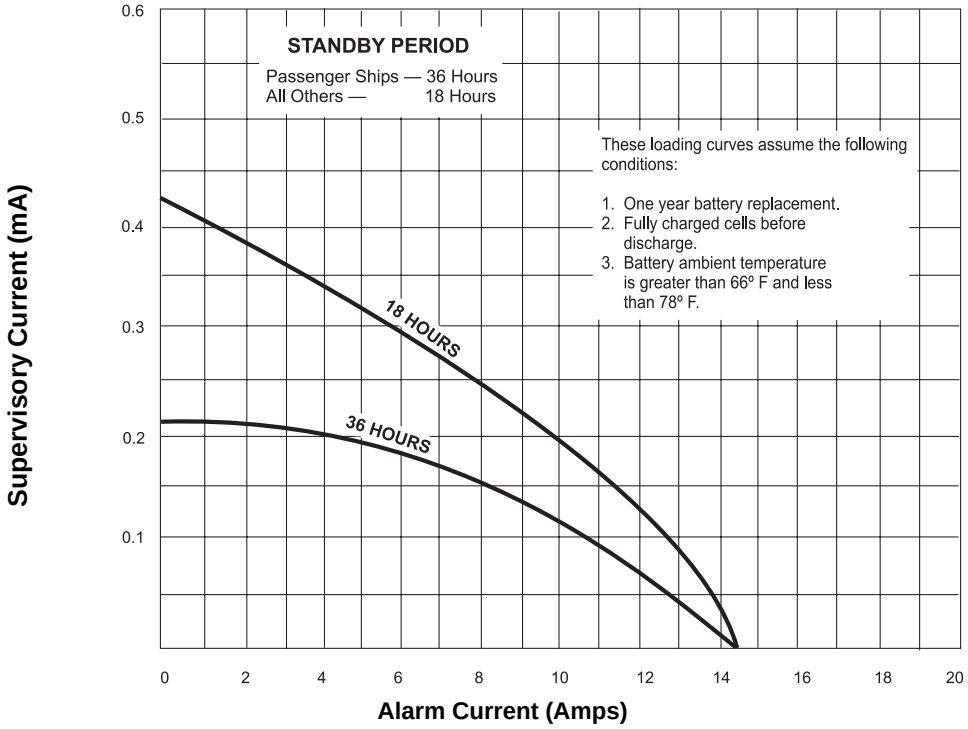
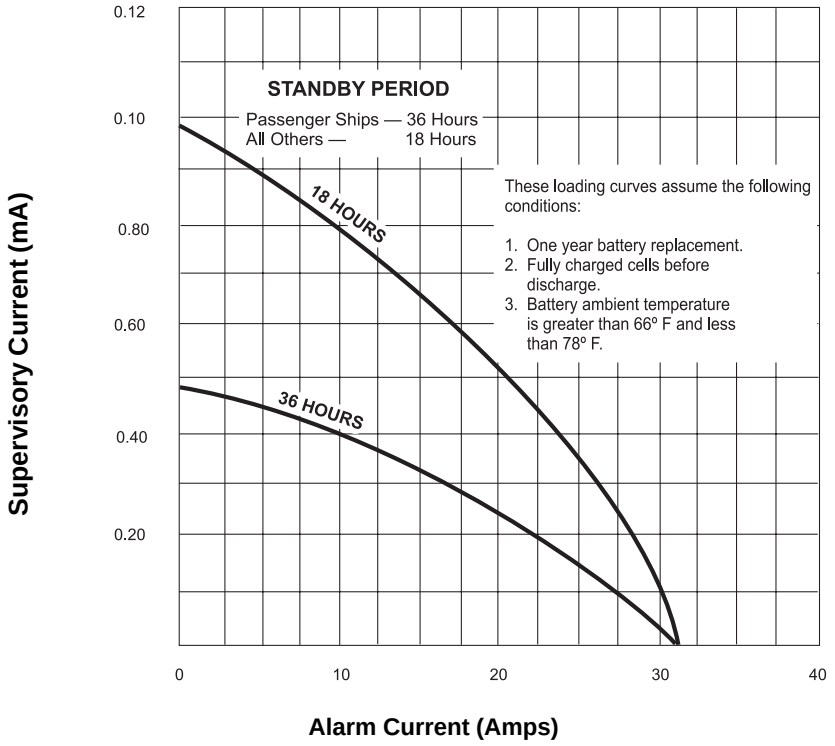


CHART C
28 AH Rated Capacity at 20 Hour Rate

Allowable Supervisory and Alarm Currents
For Standby Periods of 18 Hours and 36 Hours
Alarm Duration 5 Minutes



4. DETERMINING BATTERY SIZE NECESSARY FOR BACKUP POWER

a. Select the graph on Charts A, B, or C that seems most appropriate for the system configuration. Select the correct battery curve, depending upon whether the battery is needed for a passenger ship (36 hours of battery operation) or any other type of ship (18 hours).

b. Mark the needed supervisory current on the Y- axis and draw a straight line parallel to the X-axis between the point marked and the appropriate curve of the battery being considered.

c. Mark the needed alarm current on the X-axis and draw a line parallel to the Y-axis between that point and the appropriate curve of the battery being considered.

d. If the intersection of these two lines falls within the battery curve, that battery capacity is sufficient to handle the system.

e. If the intersection point falls above the curve or near the center of the curve, repeat the calculations on the curve of either a larger or smaller battery, as necessary, until the necessary battery capacity is found.

APPENDIX

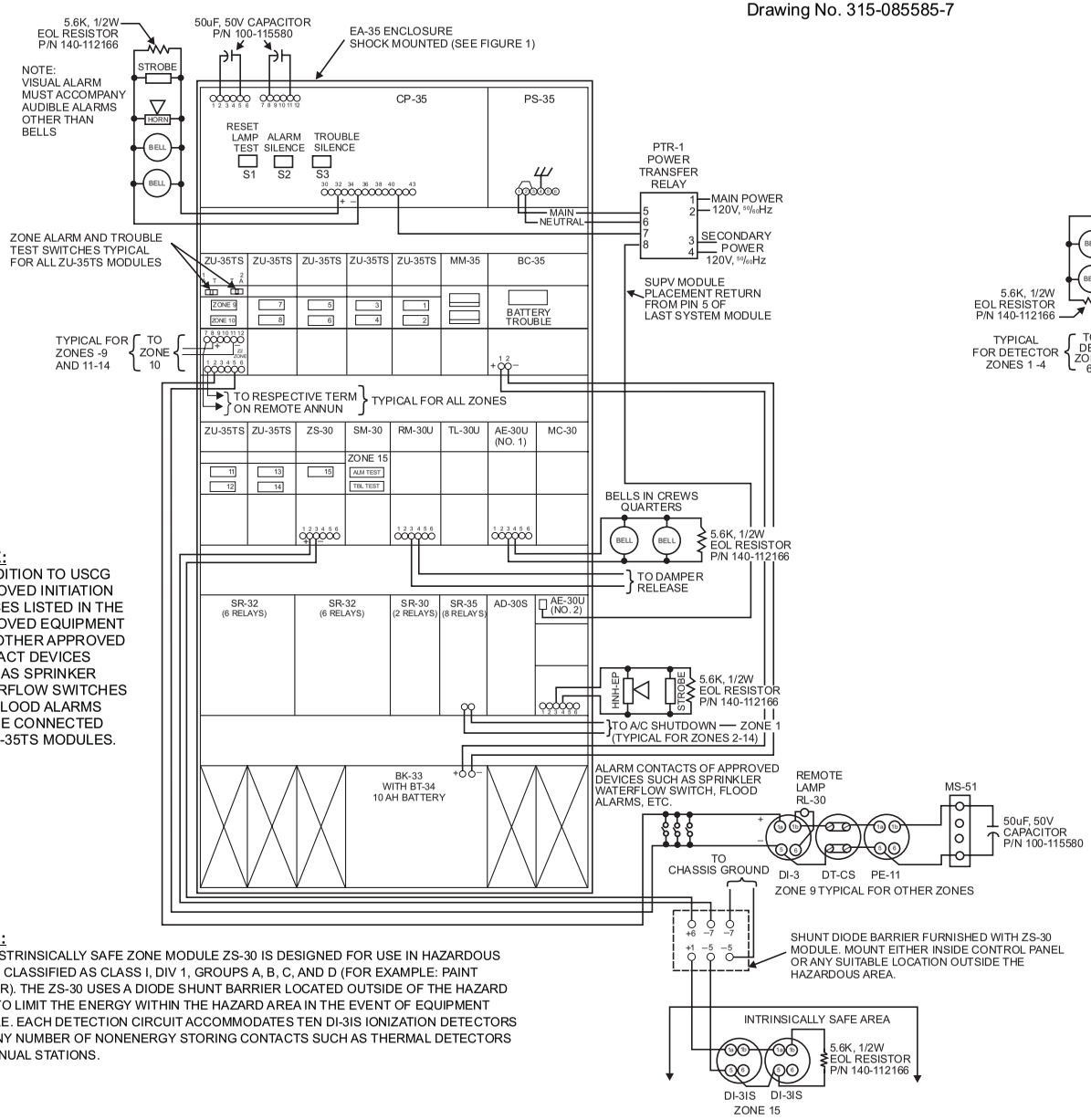
A.	COAST GUARD SYSTEM 3 TYPICAL DRAWING	Drawing No. 315-085585
B.	US COAST GUARD APPROVED EQUIPMENT LIST	Cert No:161.002/17/8
C.	PTR-1 CONNECTIONS, COVER, AND ENCLOSURE (MOUNTING)	Part No. 315-086284
D.	DM-31 MODULE ASSEMBLY	Part No. 515-021941

Coast Guard Typical System 3 Drawing

Drawing No. 315-085585-7

TYPICAL LARGE SYSTEM

(See Manual, P/N 315-086283, for description)



NOTE:
IN ADDITION TO USCG APPROVED INITIATION DEVICES LISTED IN THE APPROVED EQUIPMENT LIST, OTHER APPROVED CONTACT DEVICES SUCH AS SPRINKER WATERFLOW SWITCHES AND FLOOD ALARMS MAY BE CONNECTED TO ZU-35TS MODULES.

NOTE:
THE INSTRINSICALLY SAFE ZONE MODULE ZS-30 IS DESIGNED FOR USE IN HAZARDOUS AREAS CLASSIFIED AS CLASS I, DIV 1, GROUPS A, B, C, AND D (FOR EXAMPLE: PAINT LOCKER). THE ZS-30 USES A DIODE SHUNT BARRIER LOCATED OUTSIDE OF THE HAZARD AREA TO LIMIT THE ENERGY WITHIN THE HAZARD AREA IN THE EVENT OF EQUIPMENT FAILURE. EACH DETECTION CIRCUIT ACCOMMODATES TEN DI-3IS IONIZATION DETECTORS AND ANY NUMBER OF NONENERGY STORING CONTACTS SUCH AS THERMAL DETECTORS OR MANUAL STATIONS.

TYPICAL SMALL SYSTEM

(See Manual, P/N 315-086283, for description)

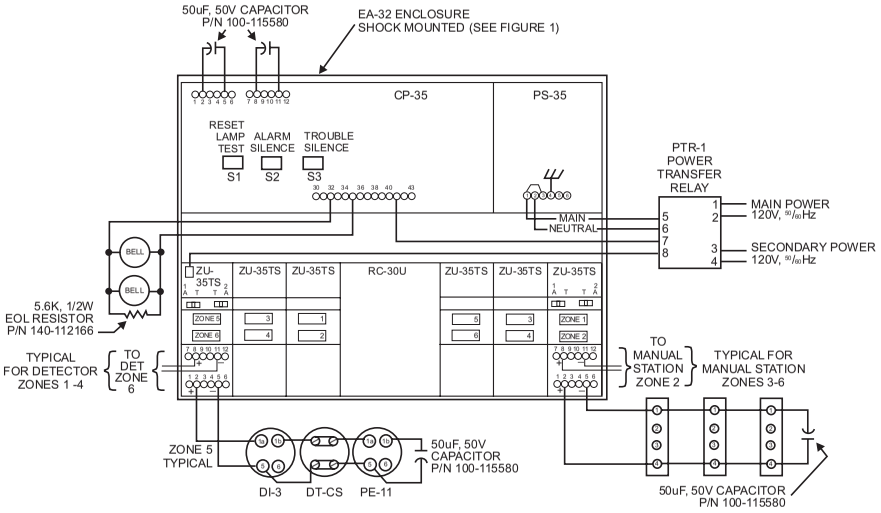


FIGURE 1
ENCLOSURE SHOCK MOUNT DETAIL

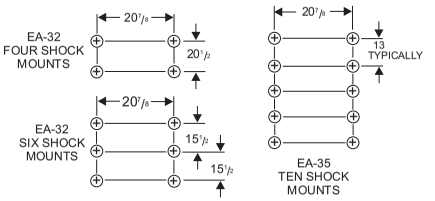
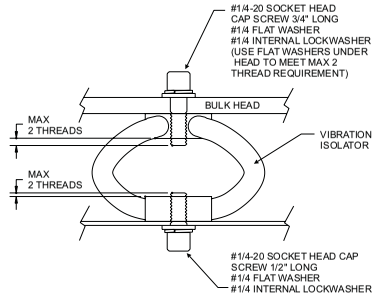


FIGURE 2
VIBRATION ISOLATOR DETAIL: COAST GUARD APPLICATION



US Coast Guard Approved Equipment List (Cert No:161.002/17/8)

System 3™

Marine Fire Detection System

1. System 3™ Control Panel/Enclosures
2. System 3™ System Modules
3. System 3™ Accessories
4. System 3™ Notification Appliances/Devices
5. System 3™ Conventional Initiating Devices/Bases
6. System Configurations
7. Previously Listed Equipment

P/N SYSTEM3-M-03
Rev-3-2/05
Pages 31-38

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www.sbt.siemens.com/fis

1. System 3™ Control Panel/Enclosures

Model No.	*Part No.*	*Description*	*Catalog No.*
ED-32DPSM	500-686192	Marine Mounting Kit (4 Shock)	3325
ED-33DPSM	500-686193	Marine Mounting Kit (6 Shock)	3325
ED-35DPSM	500-686194	Marine Mounting Kit (10 Shock)	3325

2. System 3™ System Modules

Model No.	*Part No.*	*Description*	*Catalog No.*
AD-30S	500-645050	Annunciator Driver (Supervised)	—
AE-30U	500-884320	Alarm Extender Module	3129
BC-35	500-884857	Battery Charger	3177
BE-35	500-884859	Battery Charger Extender	3177
BK-33	515-087135	Battery Module for BT33/34	3351
BT-33	175-387140	5 AH Battery Package	Manual
BT-34	175-387141	10 AH Battery Package	Manual
BTX-1	175-083897	Battery Complement 28/Amp/HR	3361
CP-35	500-884879	Control Module	3060
DM-31	500-821940	Distribution Module	Manual
MC-30	500-821710	Master Code Module	3163
MM-35	500-884860	Meter Module	3355
PM-31	500-821750	Program Module	3169
PM-32	500-822170	Program Module	3169
PS-35	500-884950	Power Supply - 10 Amp	3061
RC-30U	500-885460	Confirmation Module	3167
RM-30RU	500-884340	Releasing Device Module	3325
RM-30U	500-884330	Releasing Device Module	3062
SM-30	500-821670	Switch Module	3162
SR-30	500-821620	Dual Relay Module	3121
SR-32	500-887690	Multiple Relay Module	3125
SR-35	500-887690	Multiple Relay Module	3130
TC-30U	500-885260	Battery Transfer Module	3132
TL-30U	500-885330	Time Limit Module	3166
ZN-31U	500-886170	Dual Contact Zone	3108
ZN-34UA	500-894213	Dual Zone Supervised	3109
ZN-34US	500-895357	Dual Zone Supervised	3109
ZS-30	500-680242	Intrinsically Safe Zone	3105
ZU-35TS	500-885420	Dual Zone with Test Switches	3107

3. System 3™ Accessories

Model No.	*Part No.*	*Description*	*Catalog No.*
PTR-1	500-186248	Power Transfer Relay	Manual
RL-6	500-616120	Remote Alarm Lamp	8010
RL-30	500-390671	Remote Lamp	8011
RL-40	500-390672	Remote lamp	8011
RLP-4	500-616141	Remote Indicator	8012
RLP-8	500-616142	Remote Indicator	8012
RLP-12	500-616143	Remote Indicator	8012
RTA-38	500-684960	Remote Trouble / Alarm	---
EL-30/31	500-621296	EOL Device	---

" --- ": Catalog Sheet is not available. However, an instruction sheet is provided with the shipped equipment.

4. System 3™ Notification Appliances/Devices

Model No.	*Part No.*	*Description*	*Catalog No.*
BT-F	500-694372	Bell	2537
BT-SS	500-694387	Bell	2537
DSC	500-696872	Dual Synchronization Control Module	2553
DSC-W	500-696873	Dual Synchronization Control Module - White	2553
FER	500-694493	F-Series Extension Ring	2511
FERW	500-695772	F-Series Extension Ring - White	2511
FIB	500-694496	Indoor Surface Box	2511
FIBW	500-695775	Indoor Surface Box - White	2511
FWB-1	500-694494	Weatherproof Back Box	2511
FWB-1W	500-695773	Weatherproof Back Box - White	2511
FWB-2	500-694495	Weatherproof Back Box	2511
FWB-2W	500-695774	Weatherproof Back Box	2511
HN-EP	500-694290	Explosion Proof Horn - "Lower Current"	2530
HNH-EP	500-694289	Explosion Proof Horn - "Higher dB"	2530
U-EC	500-696850	Electronic Chime	2556
U-EC-W	500-696851	Electronic Chime - White	2556
U-EC-C	500-696924	Electronic Chime - Ceiling	2556
U-EC-MCS	500-699715	Wall Chime w/Adapter Strobe	2556
U-EC-MCS-C	500-699716	Chime w/Adapter Strobe Ceiling	2556
U-EC-MCS-W	500-699717	Wall Chime w/Adapter Strobe - White	2556
U-HN	500-696512	Electro-Mechanical Horn - DC	2557
U-HN-W	500-696513	Electro-Mechanical Horn - DC / White	2557
U-HN-C	500-696935	Electro-Mechanical Horn - DC /Ceiling	2557
U-HN-MCS	500-699724	Electro-Mechanical Horn -DC w/Adapter Strobe	2557
U-HN-MCS-C	500-699725	Electro-Mechanical Horn -DC w/Adapter Strobe-Ceiling	2557
U-HN-MCS-W	500-699726	Electro-Mechanical Horn -DC w/Adapter Strobe-White	2557
U-HN-S110-1	500-696692	Electro-Mech. Horn - DC w/110CD Strobe	2557
U-HN-S110-1-W	500-696693	Electro-Mech. Horn - DC w/110CD Strobe-White	2557
U-HN-S110S-1	500-696694	Electro-Mech. Horn - DC w/110CD Sync. Strobe	2557
U-HN-S110S-1-W	500-696695	Electro-Mech. Horn - DC w/110CD Sync. Strobe-White	2557
U-HNH	500-696534	Electro-Mechanical HIDB Horn	2557
U-HNH-W	500-696535	Electro-Mechanical HIDB Horn-White	2557
U-HNH-C	500-696946	Electro-Mechanical HIDB Horn-Ceiling	2557
U-HNH-MCS	500-699729	Electro-Mechanical HIDB Horn w/Adapter Strobe	2557
U-HNH-MCS-C	500-699730	Electro-Mech. HIDB Horn w/Adapter Strobe-White	2557
U-HNH-MCS-W	500-699731	Electro-Mech. HIDB Horn w/Adapter Strobe-Ceiling	2557
U-HNH-S110-1	500-696714	Electro-Mech. HIDB Horn w/110CD Strobe	2557
U-HNH-S110-1-W	500-696715	Electro-Mech. HIDB Horn w/110CD Strobe-White	2557
U-HNH-S110S-1	500-696716	Electro-Mech. HIDB Horn w/110CD Sync. Strobe	2557
U-HNH-S110S-1-W	500-696717	Electro-Mech. HIDB Horn w/110CD Sync. Strobe-White	2557
U-MCS	500-699701	Multicandela Selectable Strobe	2550
U-MCS-W	500-699702	Multicandela Selectable Strobe-White	2550
U-MCS-AR	500-699746	Multicandela Selectable Strobe-Agent Release	2550
U-MCS-WE	500-648644	Multicandela Selectable Strobe-EVAC White	2550
U-MCS-6090V	500-699703	Multicandela Selectable Strobe-Retro Plate Mount	2550
U-MCS-6090V-W	500-699704	Multicandela Selectable Strobe-Retro Plate Mount-White	2550
U-MH	500-696558	Steady Tone Mini-Horn	2552
U-MH-W	500-696559	Steady Tone Mini-Horn-White	2552

" --- ": Catalog Sheet is not available. However, an instruction sheet is provided with the shipped equipment.

4. System 3™ Notification Appliances/Devices (Cont.)

Model No.	*Part No.*	*Description*	*Catalog No.*
U-MH-MCS	500-699711	Steady Tone Mini-Horn w/Adapter Strobe	2552
U-MH-MCS-W	500-699712	Steady Tone Mini-Horn w/Adapter Strobe-White	2552
U-MH-1G	500-696556	Steady Tone Mini-Horn 1Gang Mount	2552
U-MH-1G-W	500-696557	Steady Tone Mini-Horn 1 Gang Mount	2552
U-MHT	500-696582	Steady / Temporal Tone Mini-Horn / Strobe	2552
U-MHT-W	500-696583	Steady/Temporal Tone Mini-Horn / Strobe	2552
U-MHT-MCS	500-699709	Temporal Horn w/Adapter Strobe	2552
U-MHT-MCS-W	500-699710	Temporal Horn w/Adapter Strobe-White	2552
U-MHT-1G	500-696580	Steady/Temporal Tone Mini-Horn 1 Gang Mount	2552
U-MHT-1G-W	500-696581	Steady/Temporal Tone Mini-Horn 1 Gang Mount-White	2552
U-MMT	500-696606	8-Tone Electronic Horn	2554
U-MMT-W	500-696607	8-Tone Electronic Horn-White	2554
U-MMT-AR	500-699759	8-Tone Electronic Horn Agent Release	2554
U-MMT-1G	500-606604	8-Tone Electronic Horn single gang	2554
U-MMT-1G-W	500-606605	8-Tone Electronic Horn single gang-White	2554
U-MMT-MCS	500-699713	8-Tone Electronic Horn w/Adapter Strobe	2554
U-MMT-MCS-W	500-699714	8-Tone Electronic Horn w/Adapter Strobe-White	2554
U-MMT-MCS-AR	500-699758	8-Tone Electronic Horn w/Adapter Strobe Agent Release	2554
U-S110-1	500-696658	110cd Strobe	2539
U-S110-1-W	500-696659	110cd Strobe-White	2539
U-S110S-1	500-696660	110cd Sync. Strobe	2539
U-S110S-1-W	500-696661	110cd Sync. Strobe-White	2539

5. System 3™ Conventional Initiating Devices/Bases

Model No.	*Part No.*	*Description*	*Catalog No.*
AD-3I	500-086495	Air Duct Housing for Series 3 Ionization Detectors	6124
AD-3RI	500-086497	Air Duct Housing with Relay	6124
AD-11P	500-095656	Air Duct Housing for PD-11 Detectors	6178
AD-11PR	500-095657	Air Duct Housing with Relay	6178
ADB-11	500-096117	Audible Base	---
DB-3S	595-381804	Universal Base	---
DB-11	500-094151	Detector Base	6173
DB11-SEAL	500-695622	DB-11 SEAL for DB-11	Manual
DB-ADPT	500-094187	Detector Base Adapter	---
DB-SEAL	500-692211	DB-SEAL for DB-3S	Manual
DI-3	500-081806	Ionization Detector (Series 3)	6119
DI-A3	500-083263	Ionization Detector Hi Velocity	6119
DI-B3	500-085081	Ionization Detector Air Duct	6119
DI-3IS	500-083117	Ionization Detector Intr. Safe	6119
DT-11	500-095430	Thermal 135 Degree	6174
DT-135CS	500-017585	Rate Comp./Fixed Temp 135°	6131
DT-200CS	500-017586	Rate Comp./Fixed Temp 200°	6131
DT-135CL	500-017541	Rate Comp./Fixed Temp LMP/Locking	6131
DT-200CL	500-017542	Rate Comp./Fixed Temp LMP/Locking	6131
DT-135WP	500-087260	Rate Comp./Fixed Temp Weatherproof	6127
DT-200WP	500-087261	Rate Comp./Fixed Temp Weatherproof	6127

" --- ": Catalog Sheet is not available. However, an instruction sheet is provided with the shipped equipment.

5. System 3™ Conv. Initiating Devices/Bases (Cont.)

Model No.	*Part No.*	*Description*	*Catalog No.*
DT-140EP	500-688976	Rate Comp./Fixed Temp 140° Expl. Proof	6127
DT-190EP	500-688978	Rate Comp./Fixed Temp 190° Expl. Proof	6127
		*** Other Temp Require Special Order **	
EAD-3	500-686214	Weatherproof Air Duct Decector Enclsoure	---
MS-51	500-620503	Manual Stations N.O. SPST	6183
MS-501	500-620522	Manual Stn. Double Action SPST	6183
MSM-K	500-698215	Metal Manual Station-Key	6184
MSM-KD	500-698216	Metal Manual Station-Key-Double Action	6184
MSM-K-WP	500-698217	Metal Manual Station-Key-Weather Proof	6184
MSM-KD-WP	500-698218	Metal Manual Sta-Key-Dbl Action-Weather Proof	6184
MSM-EXP	500-698219	Metal Manual Station-Explosion Proof	6184
MSM-INST	500-698220	Metal Manual Station-Institutional	6184
MSM-BOX	500-698221	Surface Back Box	6184
PE-11	500-094150	Photoelectric Detector	6173
PE-11T	500-095110	PE-11T Photo / Thermal Detector	6173
RR-11	500-694622	Remote Relay Module	6173

6. System Configurations

NOTE: When designing Fire Control Systems for various types of vessels, the designer should be aware of the required vessel type, domestic and SOLAS regulations applicable for that vessel.

Typical Large System 3™ Control Panel System Configurations

A. Compliance with Safety of Life at Sea (SOLAS) using USCG Approved Equipment.

B. POWER – Although the required two sources of power are available from the main and standby generators, optional short term battery backup is also acceptable. The BC-35 Battery Charger Module, the MM-35 Meter Module, and the BK-33 9 AH Battery Module serve this purpose.

C. ZONES – Fourteen smoke detection zones with manual stations included. The seven ZU-35TS modules satisfy this requirement. One intrinsically safe zone requires ion detectors, supervised automatic damper release, along with its own distinctive audible signal immediately outside the area. The ZS-30 intrinsically safe zone module, the RM-30U release module, and the AE-30U (no. 2) alarm extender module serve this purpose.

D. AUDIBLE ALARMS –

1. It is specified that bells are pulsed in order to distinguish fire signals from steady bells of the emergency alarms. The MC-30 Master Code Module does this.
2. The SOLAS requirement of sounding bells in the crews spaces if the alarm signals at the control panel have not received attention within 2 minutes is satisfied by the TL-30U Time Limit Module and the AE-30U (no. 1) Alarm Extender Module.

E. SUPPLEMENTARY CONTROL –

Each of the fourteen zones has its separate AC unit which is to be shutdown upon alarm. The three SR-32 modules serve this purpose. The SR-30 or SR-35 Relay Modules can also be used for similar control functions.

Typical Small System 3™ Control Panel System Configurations

This small cruise ship requires six zones to cover the accommodation spaces. The low deck heights of 7 feet 3 inches increases the possibility of smoke detectors alarming to tobacco smoke. The use of the RC-30U confirmation module will tend to eliminate this concern by not reporting, but recording first alarm and requiring the device to alarm a second time within a time frame adjustable to 1 minute, as this alarm confirmation results in an alarm delay. In the event of a true fire, it would be undesireable to have manual station activation so delayed. Therefore, the manual stations are connected to their own ZU-35TS Zone Modules not under the influence of the RC-30U.

Detector Spacing (Maximum)

Type	Model	Feet Between Detectors	Feet to Wall or Partition
Heat Rate Comp	DT-11	50*	25*
Heat Rate Comp	DT-135/200CL	50*	25*
Heat Rate Comp	DT-135/200WP	50	25
Heat Rate Comp	DT-140/190XP	50	25
Ionization	DI-3	40	15
Ionization	DI-3IS	30	15
Photoelectric Smoke	PE-11/11T	30	15

* These maximum recommended spacings are based on smooth ceilings and moderate air flow. In other cases detector spacing should be shortened accordingly. Refer to NFPA 72 Annex A (2002 Edition) for guidance.

Maximum Number of Devices per Circuit

Ion detectors — 30 in any combination, plus any number of heat or manual stations, except for intrinsically safe circuits (see Note on page 30 for intrinsically safe zone module regarding the number of DI-3IS detectors allowed per zone).

Heat and manual station — only practical limitations.

Alarm circuits limited to 1.5A

NOTES:

1. These Typical control panels show external wiring connections only for customized module wiring. Refer to the respective wire list and the appropriate specification sheets as shown in the Marine Fire Detection System Manual.
2. For proper wiring connections to the various approved detectors and notification appliances refer to the Marine Manual.
3. Refer to the Marine Manual for additional details.

7. Previously Listed Equipment

Model No.	*Part No.*	*Description*	*Catalog No.*
ZB-35	500-890065	Linear beam Module	3110
EL-32	500-621297	EOL Device	---
BACW-6	500-688442	Polarized Bell 6" 120 VAC	2515
BACW-10	500-688443	Polarized Bell 10" 120 VAC	2515
MBDC-6	500-688448	6" 24 VDC Motor Bell	2513
MBDC-10	500-688449	10" 24 VDC Motor Bell	2513
MT	500-693130	Multitone Signal	2521
MT4	500-693131	Multitone Signal (4" Sq. Electrical Box)	2521
MTS15/75	500-693134	15/75CD Non Sleeping, Clg & Wall	2521
MTS4-15/75	500-693135	15/75CD Non Sleeping, Clg & Wall (4" Sq. Electrical Box)	2521
S15/75-STD	500-693112	Strobe 15/75 CD	2520
S110-STD	500-693116	Strobe 110 CD	2520
DI-4A	500-025402	Ionization Detector (Series 4)	6113
DI-6	500-185487	Ionization Detector Adjustable	6126
PE-3	500-091540	Photoelectric Smoke Detector	6160
PE-3T	500-091920	Photoelectric Smoke w/ 135 Heat	6160
S121	500-085145	Infra-Red Solar Blind Flame Det.	6144
S122	500-086476	Infra-Red (Non Solar Blind)	6144
S-2406	500-089951	I.R. Flame Detector, Dual Sensor	6150
DF-1	500-016425	Infra-Red Flame Det. User w/ DB-3S	6120
DF-30	500-092600	U.V. Flame for Use w/ DB-3S	6127
PB-2400	500-089949	Proj. Beam Smk. Det. Trns/Rec.	6149
LA-1	500-690052	Adjustment Lamp for Lens Aln.	6149
TF1	500-690053	Test Kit w/ Three Filters	6149
PB-1191	500-095076	Linear Beam Detector (P/N 315-095424-2)	6171
BT-LC	500-694382	Bell	2537
U-EC-S17	500-696852	Electronic Chime/Strobe	2544
U-EC-S17C	500-696925	Electronic Chime/Strobe - Ceiling	2544
U-EC-S17S	500-696854	Electronic Chime/Sync. Strobe	2544
U-EC-S30	500-696856	Electronic Chime/Strobe	2544
U-EC-S30S	500-696858	Electronic Chime/Sync. Strobe	2544
U-HN-S17	500-696514	Electro-Mechanical Horn / Strobe	2541
U-HN-S17S	500-696516	Electro-Mechanical Horn / Sync. Strobe	2541
U-HN-S30	500-696518	Electro-Mechanical Horn / Strobe	2541
U-HN-S30W	500-696519	Electro-Mechanical Horn / Strobe-White	2541
U-HN-S60	500-696522	Electro-Mechanical Horn / Strobe	2541
U-HN-S60S	500-696524	Electro-Mechanical Horn / Sync. Strobe	2541
U-HN-S75	500-696526	Electro-Mechanical Horn / Strobe	2541
U-HN-S75S	500-696528	Electro-Mechanical Horn / Sync. Strobe	2541

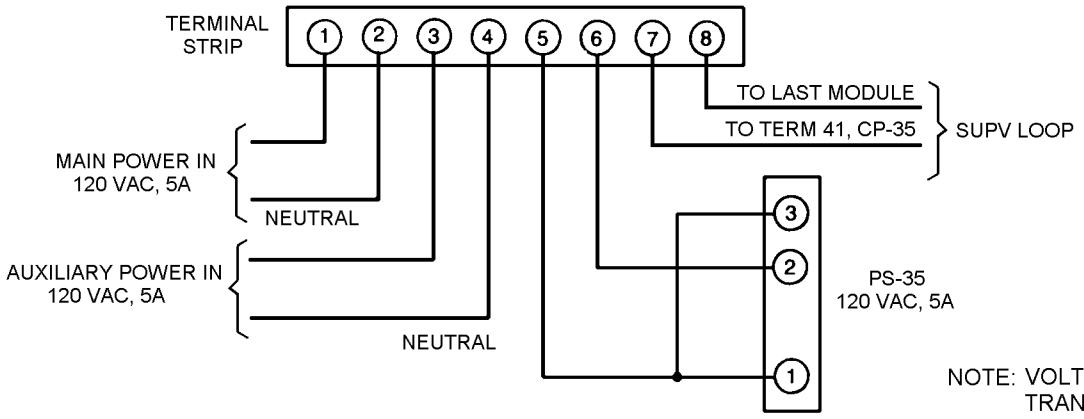
" --- ": Catalog Sheet is not available. However, an instruction sheet is provided with the shipped equipment.

7. Previously Listed Equipment (Cont.)

Model No.	*Part No.*	*Description*	*Catalog No.*
U-HNH-S17-W	500-696537	Electro-Mechanical HIDB Horn / Strobe	2541
U-HNH-S17S-W	500-696539	Electro-Mechanical HIDB Horn / Sync. Strobe	2541
U-HNH-S30-W	500-696541	Electro-Mechanical HIDB Horn / Strobe-White	2541
U-HNH-S30S	500-696542	Electro-Mechanical HIDB Horn / Sync. Strobe	2541
U-HNH-S30S-W	500-696543	Electro-Mechanical HIDB Horn / Sync. Strobe-White	2541
U-HNH-S60-W	500-696545	Electro-Mechanical HIDB Horn / Strobe-White	2541
U-HNH-S60S-W	500-696547	Electro-Mechanical HIDB Horn / Sync. Strobe-White	2541
U-HNH-S75-W	500-696549	Electro-Mechanical HIDB Horn / Strobe-White	2541
U-HNH-S75S-W	500-696551	Electro-Mechanical HIDB Horn / Sync. Strobe-White	2541
U-MH-S17-W	500-696561	Steady Tone Mini-Horn / Strobe-White	2543
U-MH-S17S-W	500-696563	Steady Tone Mini-Horn / Sync. Strobe-White	2543
U-MH-S30-W	500-696565	Steady Tone Mini-Horn / Strobe-White	2543
U-MH-S30S-W	500-696567	Steady Tone Mini-Horn / Sync. Strobe-White	2543
U-MH-S60S-W	500-696571	Steady Tone Mini-Horn / Sync. Strobe-White	2543
U-MH-S75-W	500-696573	Steady Tone Mini-Horn / Strobe-White	2543
U-MH-S75S-W	500-696575	Steady Tone Mini-Horn / Sync. Strobe-White	2543
U-MHT-S17-W	500-696585	Steady / Temporal Tone Mini-Horn / Strobe	2543
U-MHT-S17S-W	500-696587	Steady / Temporal Tone Mini-Horn / Strobe	2543
U-MHT-S30	500-696588	Steady / Temporal Tone Mini-Horn / Strobe	2543
U-MHT-S30-W	500-696589	Steady / Temporal Tone Mini-Horn / Strobe-White	2543
U-MHT-S30S-W	500-696591	Steady / Temp. Tone Mini-Horn / Sync. Strobe-White	2543
U-MHT-S60-W	500-696593	Steady / Temporal Tone Mini-Horn / Strobe-White	2543
U-MHT-S60S-W	500-696595	Steady / Temp. Tone Mini-Horn / Sync. Strobe-White	2543
U-MMT-S17-W	500-696609	8-Tone Electronic Horn / Strobe-White	2542
U-MMT-S17S-W	500-696611	8-Tone Electronic Horn / Sync. Strobe-White	2542
U-MMT-S30-W	500-696613	8-Tone Electronic Horn / Strobe-White	2542
U-MMT-S30S-W	500-696615	8-Tone Electronic Horn / Sync. Strobe-White	2542
U-MMT-S60S	500-696619	8-Tone Electronic Horn / Sync. Strobe	2542
U-S17	500-696460	Stand Alone Strobe	---
U-S17-W	500-696461	Stand Alone Strobe-White	---
U-S17S	500-696462	Stand Alone Sync. Strobe	---
U-S17S-W	500-696463	Stand Alone Strobe-White	---
U-S30	500-696464	Stand Alone Strobe	---
U-S30-W	500-696465	Stand Alone Strobe-White	---
U-S75	500-696472	Stand Alone Strobe	---

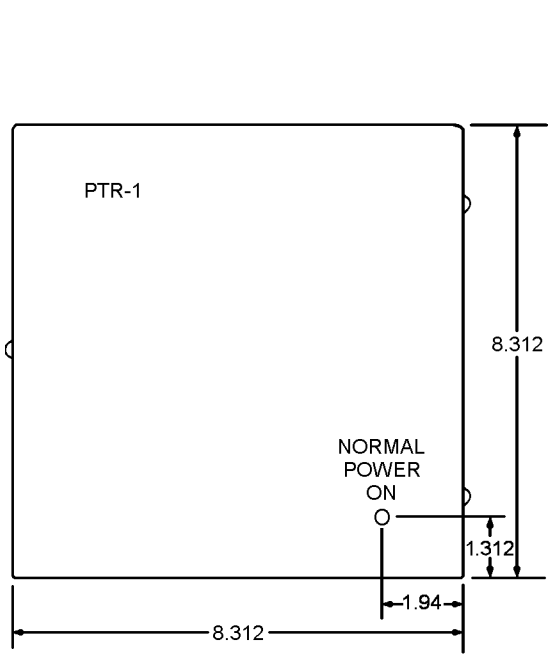
" --- ": Catalog Sheet is not available. However, an instruction sheet is provided with the shipped equipment.

Power Transfer Relay
Model PTR-1

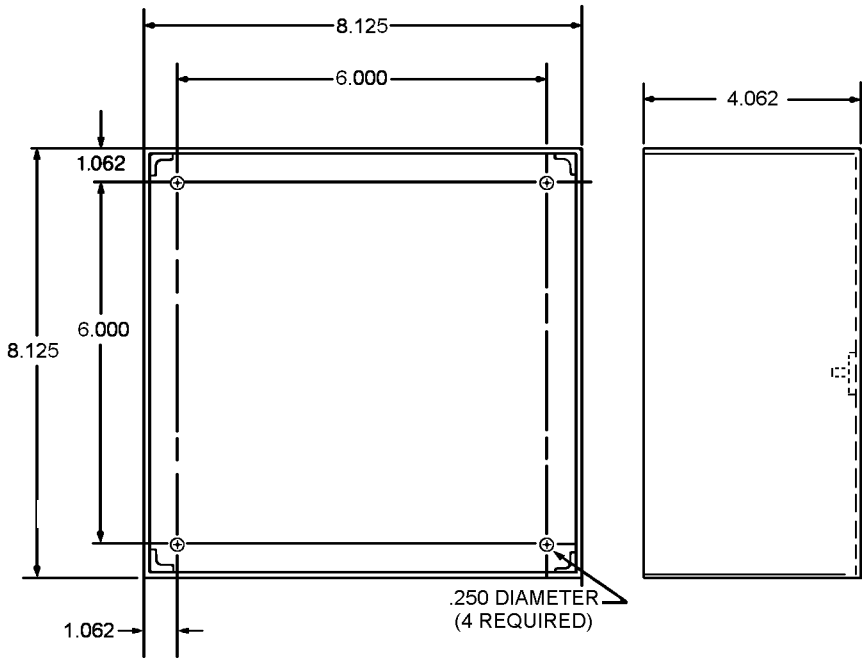


NOTE: VOLTAGE SENSITIVE POWER TRANSFER RELAY ADJUSTED TO DROP OUT AT 97V ± 3V PULL IN AT 106V ± 6V

PTR-1 CONNECTIONS

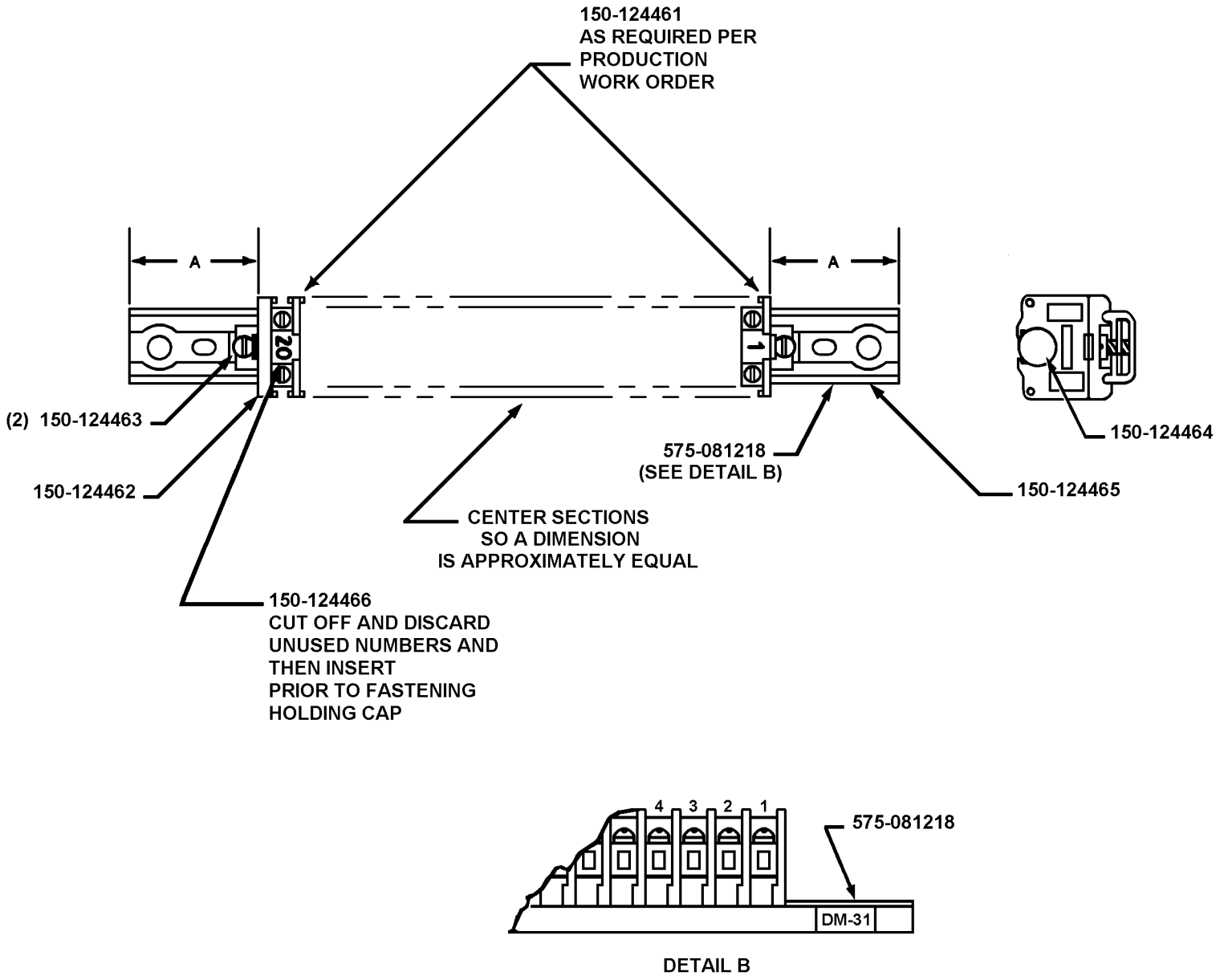


PTR-1 COVER (DRIP-PROOF)



PTR-1 ENCLOSURE (MOUNTING)

P/N 315-086284A



DETAIL B

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