

**TSA-200 / TSA-200XT
and
TSA-240 / TSA-240XT**

**Conventional
Two-and Four-Zone
Fire Alarm Control Panel**

Technical Manual



TELEFIRE FIRE & GAS DETECTORS LTD

PO Box 7036
Petach Tikva 49250
Israel

Tel: 972 3 970 0400
Fax: 972 3 921 1816
eMail: info@telefire.co.il
Web: www.telefire.co.il



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Note

Fire alarm systems are composed and assembled of different devices and subsystems, such as control panels, annunciators, smoke detectors, heat detectors, manual call points, extinguishing activation devices, and annunciating devices intended to alert to fire / smoke.

Using this system does not ensure protection from or prevention of fire and/or smoke damages, but proper use of the system may reduce fire and smoke damages.

Proper system configuration design, including all of its components and infrastructure, as well as proper installation according to the manufacturers' instructions and the applicable standards – are a conditioned precedent for the proper and efficient function of the system.

The designer and installer should have the appropriate skills and qualifications for performing said installation and all damages or losses resulting from improper design and/or installation lie with the designer and/or installer alone.

All loss or damage caused by improper action shall lie with the originator of said improper action.

The manufacturer shall not be liable for any fire and/or fire damages caused by fire in location where fire systems are installed and or results of direct or indirect fire damage that may be caused to any persons and/or property and/or third parties as a result of using the product and/or resulting from its inaction.

Record of Changes

No.	Date	Revision	Details	Author
1	14.04.2011	1.00	Initial Release	I. Reshef
2	17.07.2011	1.01	Minor corrections-update front panel display functions. Remove reference to EVAC sounder silencing and clarify silencing for all devices. Distinguish between Reset and Disablements. Update Front Panel functionality. Add EOL paragraph. ADD EOL resistors in drawings. (or add note about EOL resistors in the drawings) Update EOL and reorder paragraphs Update mounting	I. Reshef
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7	18.03.2014	1.06	Correct minor errors Refer to revised EM1 Updated to reflect TSA-240 / 240XT	I. Reshef

*i***Note**

The terms "Control Panel" as used in NFPA 72 guideline and UL 864 standard and Control and Indicating Equipment (CIE) as used in EN 54 standards are used interchangeably throughout this manual.

*i***Note**

The terms "Trouble" as used in NFPA 72 guideline and UL 864 standard and "Fault" as used in EN 54 standards are used interchangeably throughout this manual

*i***Note**

All maintenance and repair work performed on the TSA-200 shall be performed by qualified and authorized personnel ONLY

*i***Note**

Do not install, operate, or maintain this product before fully reading and thoroughly understanding this manual.

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1 Introduction

Telefire's new generation conventional Control and Indicating Equipment (CIE, also termed Fire Alarm Control Panel, FACP, or Fire Detection and Alarm System, FDAS) narrows the gap between analog and conventional systems. Drawing on over three decades' of experience in designing and manufacturing fire alarm Control and Indicating Equipment (CIE), the state of the art TSA-200 / TSA-200XT / TSA-240 / TSA-240XT Conventional Two- and Four-Zone Fire Alarm Control and Indicating Equipment (CIE) is certified to EN 54-2 and EN 54-4; is CE marked, is certified to GOST 53325-2009 and complies with UL 864 Edition 9.

The TSA-200 product family is ideally suited for new and retrofit applications. The base Control and Indicating Equipment (CIE, or Control Panel, CP) supports two or four zones, a horn output, an Alarm dialer output, a Fault Dialer Output and two relays. The system supports maintenance alert and drift compensation for detectors (dependant on using Telefire detectors), a function that required, until now, analog addressable panels. Walk test mode allows for detector testing by only one technician, whilst discriminating between triggers caused by the "test" process and actual alarms.

The system supports alarm dependency on more than one alarm signal (an alarm verification feature, or AVF-Alarm Verification Function) to increase system reliability and reduce nuisance alarms.

The TSA-200 can be converted into the TSA-200XT, a Fire Alarm and Extinguishing control panel, by adding the EM1 Extinguishing Expansion Module.

The display logic of the TSA-200/TSA-200XT is that of UL,

(i.e. events cause LEDs to flash until the events are acknowledged)

making the TSA-200/TSA-200XT human interface UL864 compliant, as well as EN 54-2 and EN 54-4 certified.

The (original) EM1 card has two level activation outputs, using bipolar transistors.

The EM1 Rev. 1.1 is modified so output 3 is change polarity, and output 4 is Level Activation. Both outputs use FETs.

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Note

If an EN 12094-1 certified CDE (Electrical Automatic Control and Delay Equipment) is required, please consult Telefire Fire and Gas Detectors Ltd. regarding the TSA-200X, TSA-1000X and other products.

2 Functions and Options

2.1 EN 54-2 – Options with Requirements

The TSA-200 product family conforms fully to European standards BS EN 54-2:1998 (including Amendment A1:2006) and EN 54-4:1998 (including Amendments A1:2002 and A2:2006) and the following optional features:

- *Output to fire alarm devices* – EN 54-2 Section 7.8 option with requirements
- *Output to fire alarm routing Equipment* – EN 54-2 Section 7.9 option with requirements
- *Output to fire alarm protection Equipment* – EN 54-2 Section 7.10 option with requirements (TSA-200XT and TSA-240XT only)
- *Dependencies on more than one alarm signal* - EN 54-2, section. 7.12 (type A or type B), option with requirements.
- *Total loss of power supply* – EN 54-2 Section 8.4 option with requirements
- *Output to fault warning routing Equipment* – EN 54-2 Section 8.9 option with requirements
- *Test condition* – EN 54-2 Section 10 option with requirements

2.2 UL 864

The TSA-200 / TSA-200XT / TSA-240 / TSA-240XT, human interface also conforms to UL 864 edition 9.

2.3 TSA-200XT / TSA-240XT Extinguishing-Specific Functions

In addition to the EN 54-2 requirements and options with requirements detailed above, the TSA-200XT and TSA-240XT also provides the following additional functions

- Extinguishing Delay, 0 or 30 Sec, User Programmable. (Default -No delay)
- Extinguishing Pulse Duration, 20 seconds.
- Extinguishing Inhibit (Abort/Hold) input.
- Manual Release (extinguishing Trigger) input
- Manual Release delay (Default-No delay)

2.4 Additional Functions

In addition to the EN 54-2 requirements and options with requirements detailed above, the TSA-200 product family also provides the following additional functions

- Auxiliary 24V outputs.
- Detectors maintenance alert (For Telefire's detectors ONLY)

2.5 Support Functions

- Lights (LEDs) Test

3 Important Notes

A detailed explanation of the operation of the ECD is provided later. The information in the current chapter is provided to highlight certain issues.

3.1 Triggering Requirements

The EN 12094-1 standard (par. 4.4), requires that an ECD has to enter the extinguishing process when triggered from a single source (zone) or from a Manual Release Triggering Device.

Some countries require triggering from two independent transmission paths for entering the extinguishing process.

Although the TSA-200XT and TSA-240XT are EN-54-2 compliant (and not EN-12094-1 compliant), this EN-12094 requirement is complied with in the TSA-200XT / TSA-240XT, and is referred to in this manual as "Two Zones Coincidence".

3.2 Single Zone Activation

The TSA-200XT / TSA-240XT can be programmed to enter the extinguishing state (or extinguishing delay, if delay is programmed) when Alarm is triggered FROM ONE DETECTORS ZONE ONLY, where the (single) activation zone is selected by programming.

NOTE! The default configuration of the TSA-200XT / TSA-240XT is activation on two zones coincidence of zone 1 AND zone 2.

3.3 Two Zones Coincidence

Two zones coincidence, a mandatory requirement in some European countries, is explained below.

When the ECD is configured for two zones coincidence, a trigger from one of the zones which are members of the "extinguishing decision group" will change the state of the ECD to "Fire Alarm". Trigger from a second zone, which is a member of the "extinguishing decision group", will cause the ECD to enter the "Activated" state. If a Non-Zero Delay is programmed, the ECD will enter the "Pre Discharge Warning Time". If the programmed Delay is zero, or if the warning time (delay) expires, the extinguisher is triggered immediately.

NOTE! The default configuration of the TSA-200XT / TSA-240XT is activation on two zones coincidence of zone 1 AND zone 2.

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Note

If zones, which are not members of the extinguishing decision group, receive an Alarm signal, the ECD changes its state to "Fire Alarm", BUT DOES NOT ENTER THE ACTIVATED states, and the extinguisher is NOT triggered even if two such zones are triggered and are in the "Alarm" state.

3.4 Dependency on More Than One Alarm Signal

The TSA-200/TSA-200XT/TSA-240/TSA-240XT supports the "Dependency on more than one alarm signal" function, also termed "Alarm Verification Function" (AVF), as detailed in EN-54-2, para. 7.12.

The alarm Delay and Confirmation (verification) feature allows the control panel to ignore false, short and transient alarm events, which may cause a nuisance.

This feature is based on an Alarm Delay Period, and an Alarm Confirmation Period.

The alarm delay can be programmed, PER ZONE, to OFF (No Delay, No Alarm Verification) or to ON. (Each zone can be programmed independently)

If the zone Alarm Delay is programmed ON, there is a 30 seconds alarm Delay (i.e. during the delay alarms are ignored), followed by a 120 seconds confirmation period

When a zone programmed for alarm verification is first triggered, the control panel resets the zone in alarm, waits for 30 seconds (if Delay is ON) and enters a 120 seconds (2 minutes) confirmation period. During the 30 seconds delay period, alarms are ignored. During the 120 seconds confirmation period, the control panel enters the alarm state immediately if a trigger from the same zone or from another zone is received, even if the other zone is programmed for alarm delay and confirmation).

If, during the alarm confirmation period, no alarm is received, the ECD reestablishes the quiescent condition.

Each detectors zone can be independently programmed for Alarm Delay and Confirmation, (Alarm Verification).

The dependencies supported, as per EN 54-2, paragraph 7.12 are type A or type B, depending on the configuration of the TSA-200 / TSA-200XT / TSA-240 / TSA-240XT.

3.5 Note Regarding Default Configuration

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Note

By default, the TSA-200XT and TSA-240XT are programmed for Two Zones Coincidence, and NO Alarm Delay (No Alarm Verification).

To modify these (and additional) settings, the TSA-200XT / TSA-240XT must be programmed accordingly.

3.6 Number of Detectors

EN 54-2, Annex C, specifies a limit of 32 detectors per zone, which is the limit of each zone of the TSA-200, TSA-200XT; hence the TSA-200 / TSA-200XT are limited to 64 detectors, in a two zones configuration.

EN 54-2, Annex C, specifies a limit of 32 detectors per zone, which is the limit of each zone of the TSA-240, TSA-240XT; hence the TSA-240 / TSA-240XT are limited to 128 detectors, in a four zones configuration.

3.7 TSA-200, TSA-200XT EN Certification

The TSA-200 is a Control and Indicating Equipment (CIE), also termed (FDAS, Fire Detection and Alarm System). It also referred to as a Fire Alarm Control Panel. It can be converted to an extinguishing control panel, the TSA-200XT, by installing the EM1 Extinguishing Expansion Module

Both models are certified to EN 54-2 and EN 54-4, and are CE marked.

3.8 UL 864 compatibility

The Display Logic of the TSA-200 product family is that of UL 864, edition 9, where some events, i.e. Alarm and Fault (System generated events) are displayed by flashing indicators, changing indication to ON (steady) when acknowledged. This is explained later.

Hence the TSA-200 product family has the UL 864 edition 9 human interface characteristics, makes, as well as being EN 54-2 and EN 54-4 certified.

NOTE! IF an **EN 12094-1 certified** CIE/CDE (EXTINGUISHING CONTROL PANEL) IS REQUIRED, PLEASE CONTACT TELEFIRE Ltd. ABOUT AVAILABLE PRODUCTS.

3.9 Suitability of use in various environments

3.9.1 Environmental Limits and Protection Level

The TSA-200 product family environmental limits are specified in EN-54-02:1998 paragraph 12.

The TSA-200 Product family is specified for -5 °C to +40 °C temperature range, RH max 95%, and IP30 protection level.

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Note

See [Routing cables into the ECD and maintaining the protection level](#) page 25, for information about maintaining the protection level.

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Note

Do not operate the ECD outside the specified limits.

3.9.2 Suitable Environment

The TSA-200 product family environmental limits are stated above. It is to be installed in an indoors location, well ventilated location, protected from the elements.

Avoid locating the CP in direct sunlight or near sources of heat.

It is recommended to install the CP in an electrically quiet location (i.e. away from high power cables, motors, etc).

3.10 Limiting the Consequences of Faults

See [Power Supply, Charger and Batteries](#), page 22, for explanation of PS/Charger limiting/protection devices.

The Main Board, which contains the charge control circuitry and the battery protective resettable PTC, also has a common electronic limiter for most output ports (It does not protect the contacts of relays!), which are monitored by the CPU

If there is an overload on an output (or outputs), the common limiter shuts off, the buzzer sounds and the visual fault indication and the Fault relay are switches ON. The CPU switches OFF all the controlled outputs. It then switches ON the separate outputs in sequence, until the faulty output is isolated. All "good" outputs are then switched ON, except for the faulty outputs.

The controlled outputs (i.e. all outputs except relays' contacts or OC outputs) are continuously monitored.

Recovery from faults is detected by the CPU and all relevant recovered outputs are reactivated, if necessary.

Open Collector outputs are current limited by design, by series connected high value resistors.

NOTE! The control panel shall be powered by a dedicated mains circuit with its own circuit breaker.

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Note

Relays' contacts are neither monitored nor current limited.

Use external protective circuitry to protect the relays' contacts circuitry.

4 Terms, Definitions and Abbreviations

4.1 Abbreviations

Abbreviation	Meaning	Remarks
CIE	Control and Indication Equipment	
CP	Control Panel	
ECD	Electrical Automatic Control and Delay Device	
TB	Terminal Block	
MCP	Manual Call Point	
PB	Push Button	
PC	Personal Computer	
PS	Power Supply	
PSE	Power Supply Equipment	
PW	Password	
M	Minute	
#	(Number)	
FACP	Fire Alarm Control Panel	
FDAS	Fire Detection and Fire Alarm System	
FWRE	Fault Warning Routing Equipment	Fault Dialer
FARE	Fire Alarm Routing Equipment	Alarm Dialer
RRE	Released Routing Equipment	Released Dialer
AC	Alternating Current	
AH	Ampere Hours	
RH	Relative Humidity	
PTC	Positive Temperature Coefficient	Self Reset Fuse
SW	Software	
COTS	Commercial Off The Shelf	
MB	Main Board	
mm	Millimeter, 1/1000 of a meter	Unit of Length
Kgm	Kilograms, 1000 grams.	Unit of Weight
IDC	Insulation Displacement Cable	
EVAC	Evacuation	
EM	Expansion Module	
Sec	Second	

4.2 Terms and Definitions

TERM	MEANING
Event	A change which is detectable by the ECD and (usually) causes a response.
Assert	Fulfill requirements and cause a response.

4.3 Functional Drawing

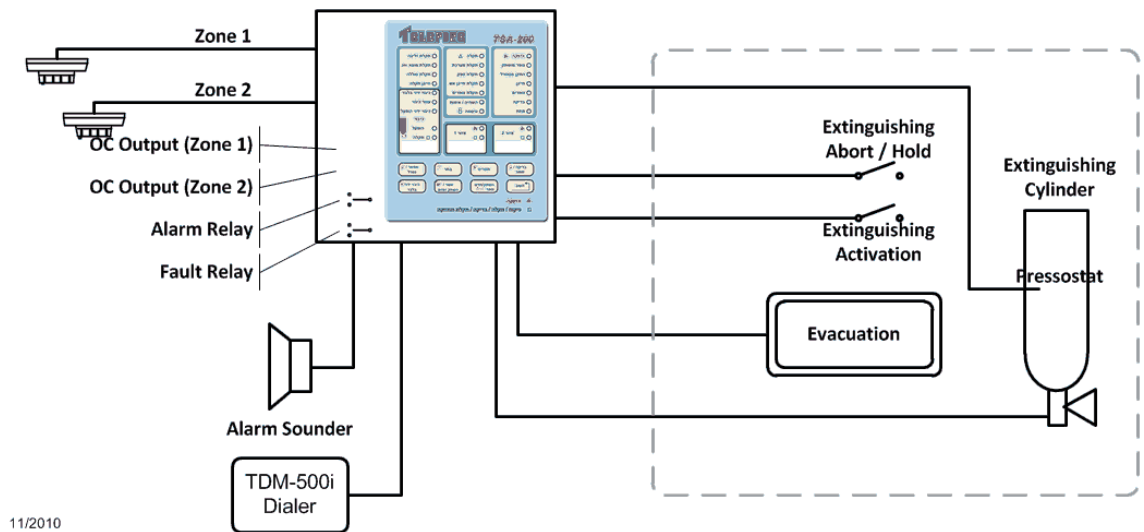


Figure 1 TSA-200 / TSA-200XT System Symbolic Functional Diagram

The TSA-200/ TSA-240 is Fire Alarm Control Panel (FACP), also termed a Control and Indication Equipment (CIE). It relates to the left side of Figure 1.

The blocks enclosed in the dashed line (to the right side of the diagram) are the additions located in the EM1 extinguishing Expansion Module.

With the Extinguishing module assembled and operational, the unit becomes the TSA-200XT / TSA-240XT, a Fire Alarm and Extinguishing Control Panel.

5 Safety

*i***Note**

Do not install commission, operate, or maintain this product before fully reading this manual.

*i***Note**

Whenever possible, disconnect all power sources (Line AND Battery) from the product before performing any work on the ECD.

5.1 Grounding and Mains Supply Wires Connection

*i***Note**

All installation, maintenance work and connecting/Disconnecting of the ECD to power sources shall be performed according to applicable international, national, regional and local codes and regulations, and the specific instructions by the manufacturer.

*i***Note**

All maintenance work should only be performed by trained, qualified and certified personnel.
Personnel that work on this equipment must fully read and comprehend this manual.

*i***Note**

Connection/Disconnection of the control panel to the mains should be performed by QUALIFIED AND AUTHORIZED personnel ONLY

*i***Note**

Disconnect all mains power wires (Line AND Neutral) to the circuit to which you intent to connect the control panel, before actually connecting the mains input power cable to the ECD.
Verify that the ECD enclosure is properly grounded before applying power

5.2 Batteries Handling and Safety

*i***Note**

Batteries require special care and safety precautions.

Refer to the batteries' manufacturer literature for full information.

The following information supplements and highlights manufacturer's information.

WHEN HANDLING BATTERIES, OBSERVE THE BATTERIES' MANUFACTURER'S RECOMMENDATIONS REGARDING HANDLING, CLOTHING AND PROTECTIVE GEAR.

For the TSA-200 product family, use two 12V 5 AH sealed Lead Acid batteries, such as Yuasa NP5-12 or equivalent, connected in series.

Use the supplied wires to connect to the CP to the batteries, and to connect the two batteries in series.

Since the batteries used are maintenance free, and the ECD automatically controls the battery charging, discharge and test, **NO SPECIAL** maintenance is required.

OBSERVE THE FOLLOWING:

Connect the battery to the ECD main board battery terminal block using the supplied wires. Observe polarity.

Place and connect batteries in the Control Panel, only after the Control Panel is properly installed and is in the correct (upright) position.

Place batteries so they are adjacent to the back of the Control Panel enclosure, as shown in the appropriate drawings in the TM.

Place protective covers on batteries' terminals when the battery wires are disconnected from the battery.

Remove batteries (after assembling protective terminals covers) from the CP before moving or shifting the Control Panel.

Keep the area near the batteries' terminals free of foreign objects, metals, or bare wire to avoid shorting the batteries.

Keep the batteries clean and dry

Keep the area well ventilated

Smoking, fire or sparks **ARE NOT ALLOWED** near batteries.

When working on batteries, DISCONNECT THE BATTERIES AND ALL OTHER POWER SOURCES

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Note

If batteries show any signs of swelling, rupture, fluid leakage, emission of gases or fluids, heating or discoloration, or accumulation of corrosion products near the terminals, **OR YOU HEAR A HISSING OR SPARKING SOUND**, disconnect the batteries and replace with a new pair of the appropriate type and rating.

Follow the manufacturer's instructions for cleaning the batteries and the enclosure, if necessary

Dispose of batteries properly

Do not short-circuit, puncture, crush, or dispose of batteries in fire.

Do not connect batteries to a makeshift charger or power supply.

Do not expose the batteries or its terminals to mechanical stress

Handling of materials that leak from the batteries should be done by qualified personnel using the appropriate protective gear, materials, and procedures.

If the ECD indicates a battery fault, check the wiring and the batteries.

If necessary, replace the batteries

6 Access Levels

The control panel provides protection from unauthorized access of certain functions by incorporating various access levels.

The TSA-200 / TSA-200XT / TSA-240 / TSA-240XT contain electronic and mechanical means that enact 4 access levels, as per EN 54-2, Annex A:

- Access level 1 – not limited, immediate access by operator
- Access level 2 (operator) – protected by an **operator password**. Provides all of access level 1 functions and allows access to additional functions that are performed on a regular basis by the system's operator.
- Access level 3 (programmer & installer) – protected by a **programmer password** (different from the operator's password!). Provides all of access to level 1 and 2 functions and allows access to additional functions such as programming, and access for functions performed during installation.

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Note

Access levels 2 and 3 have different passwords. This is not correlated to the number of times the password has to be keyed in to access a certain menu.

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Note

The default access level 2 password is 1111. The default access level 3 password is 2222. Access level 3 password can also be used as access level 2 password.

Some sub-menus which are accessible at level 3 require that the "level 3" (programmer) password be entered in a single menu, while other menus (for reason of additional protection) require the level 3 password to be entered in two different menus.

A "Manual & Automatic/Manual Only" KEYBOARD switch, password protected, is located on the front panel.

- Access level 4 (SEE EN 54-2 Annex A)

The batteries and AC power lines are only accessible after removing several screws, which requires a screwdriver, and opening the door.

7 Technical Specifications

7.1 Main Elements

The TSA-200 comprises the following major elements:

- A metal enclosure with a hinged door, secured by screws. The door also serves as the front panel
- A commercial (COTS), AC/DC powered Power Supply / Charger
- TSA-200M Main Board
- TSA-200D Display board
- Flat Cable for connecting the Main Board to the Display board
- Two 12V 5AH batteries, connected in series. (Not supplied by Telefire Ltd.)
- Link wire for connecting the two batteries in series
- Two (single) wires for connecting the batteries to the MB "BATTERY" terminals.
- A two wires Cable with connectors for connecting the PS to the main Board.

The TSA-200XT / TSA-240 / TSA-240XT also has the following element installed:

- TSA-200EM1 or TSA-200EM1.1 Expansion Module

7.2 Numbering of Inputs and Outputs

Main Board

Inputs: the Main board (TSA-200M) has two inputs numbered 1-2, which are detection zones inputs..

Outputs; The MB has 3 outputs. Output 1 is the "Fire Alarm Sounder" output (usually a Horn), Output 2 is the "Alarm" Dialer output. Output 3 is the FWRE (Fault Dialer) output, but is not referred to by a number, only by name.

Open Collector outputs: The MB has two Open Collector outputs, named OC (Open Collector) outputs. OC1 (MARKED AS Z1 ON THE PCB) is activated when Zone 1 is in alarm, and OC2 (MARKED AS Z2 ON THE PCB) is activated when Zone 2 is in alarm

Relays; The MB has two relays numbered 1-2. Relay no. 1 is the "Alarm" relay, and relay No. 2 is the "Fault" relay.

Extinguishing expansion Module EM!

Inputs: The EM1 Extinguishing expansion Module (board) has 3 inputs, MARKED and locally numbered 3-5. Input 3 is the Pressure Switch input, input 4 is the Manual Release input, and input 5 is the Hold/Abort input

A dedicated key of the keyboard is used to select "Manual Only" operation

Outputs: Installing the TSA-200EM1 Extinguishing Expansion Module converts the TSA-200 into the TSA-200XT, an FDAES (Fire Alarm, Detection and Extinguishing system).

The EM1 expansion module has two outputs-output 3, the "Extinguisher" output, and output 4, the "Evacuation" (or Extinguishing) Alarm Device, (Usually a Sounder/Strobe).

EM1 Rev. 1.1

In the EM1 board outputs 3,4 are Level activation. In the EM1 Rev. 1.1 board, out 3 (Extinguisher) is a Change Polarity output, while out 4, the Extinguishing Alarm Device output, is Level Activation.

7.3 Table of Technical Specifications, TSA-200 product family

ITEM	RATING	REMARKS	COMMUNICATION PARAMETERS
MECHANICAL			
Dimensions (W / H / D)	320 / 245 / 90 mm		
Weight (excluding batteries)	3.0 Kgm.		
ENVIRONMENTAL			
Operating Temperature range	-5°C ÷ +40°C, Max RH 95% (3k5)	Non condensing	
IP rating	30		
POWER RATINGS			
Mains Supply	85 ~ 264Vac, 47 ~ 63Hz	From Data Sheet	
Mains Supply Current (Typical)	0.75A/115Vac, 0.5 A/230Vac	From Data Sheet	
Mains Supply Fuse	Not Applicable	No user serviceable parts	
Power Supply output rating,	36W	From Data Sheet	
Total output current	1.5A electronic current limit	From Data Sheet	
Max Ripple & Noise Voltage	28V & Charger out: 200mVp-p		
Battery Type	Two 12V 5AH connected in series	Yuasa NP 12-5 or equivalent	
Battery Charge Voltage	27.3V±0.5V		Modulated DC
Battery Charge Current	0.3A max. Electronically limited		

ITEM	RATING	REMARKS	COMMUNICATION PARAMETERS
Battery Charge Current, CP in Alarm	No current	Charging is disabled in Alarm	
Battery Fuse	PTC, 3A	Self Resettable	
Current consumption from battery	60mA Quiescent condition, buzzer ON	Control Panel (CP) Only	
Current consumption (TSA-200XT / TSA-240 / TSA-240XT)	110mA, two zones in alarm	CP Only, extinguisher OFF	
Current consumption(TSA-200XT / TSA-240 / TSA-240XT)	160mA, two zones in alarm,	CP Only, extinguisher ON	
Max Current from Batteries	3A	Limited by PTC	
Battery voltage range	20.4V DC min to 27.8V DC max		
Max (single) battery size	to 9.5 (W) by 7 (D) by 12.5 (H) cm each		
MB INTERFACES			
Fire Alarm Relay (1) contacts rating	48V DC, 1.5A, not monitored	Dry contact SPDT	
Fault Relay (2) contacts rating	48V DC, 1.5A, not monitored	Dry contact SPDT	NC when unpowered
OUTPUTS		MB outputs are monitored	
Outputs EOL	3.9 K \pm 5%	Only required for MB outputs	

ITEM	RATING	REMARKS	COMMUNICATION PARAMETERS
MB output 1, Fire Alarm Sounder	Change Polarity, 0.6 A max OFF-6V. ON +24V		Change Polarity DC
Number of Sounders	Dependent on current consumption	See detailed explanation	
MB out 2, Alarm Dialer output	Level Activation 24V DC, 0.1A		Switched DC
FWRE output	Level Activation 24V DC, 0.1A	3 rd out referred to by name only	Power Off when activated
MB OPEN COLLECTOR OUTPUTS		OC outputs are not monitored	
OC1	24V Nominal, 50mA	Zone 1	
OC 2	24V Nominal, 50mA	Zone 2	
MB 24V OUPUTS			
+24V aux. output	24 Nominal 0.5A electronic current limit	Not affected by reset	
Resettable +24V aux. output	24 Nominal 0.5A electronic current limit	Not powered during Reset	Switched DC
INPUTS		MB inputs are monitored	
Input alarm resistance range	70-630 Ω \pm 5%, Nominal alarm resistor 200 Ω		
Input Normal Range	700 Ω - 6.5 k Ω \pm 5% Nominal EOL 3.9 K Ω \pm 5%		
Input Short Threshold	0-40 Ω \pm 5%,		

ITEM	RATING	REMARKS	COMMUNICATION PARAMETERS
Input Open threshold	7.5 kΩ to ∞		
Inputs 1-2, Detection zones	See above for inputs characteristics	Detectors /MCP	
KEYBOARD Input, "Manual Only"		Password protected	
EM1 extinguishing Module inputs	See above for inputs characteristics	EM1 card Inputs are monitored	
Input 3 Pressure Switch	See above for inputs characteristics		
Input 4 Manual Activation	See above for inputs characteristics		
Input 5 Hold/Abort	See above for inputs characteristics	Inhibit, PC Programmable	
EM1 Extinguishing Module outputs			
EM1 out 3, Extinguisher	Level Act. 24V DC, 1.0 A for 20 seconds	0.5 A continuous (Solenoid)	Switched DC
EM1 Ver. 1.1, out 3, Extinguisher	Change Polarity, 1.0 A max OFF-6V. ON +24V	1.0 A continuous (Solenoid)	Reversed Polarity DC
Extinguisher release delay	30 Seconds	Default	
Extinguisher release duration	20 Seconds	Default	
EM1 out 4, Extinguishing/Evacuation Sounder	Level Act. 24V DC, 0.5A max, continuous	Flashes in Activated state. ON in Released state,	Modulated DC

ITEM	RATING	REMARKS	COMMUNICATION PARAMETERS
EM1 Ver. 1.1 out 4, Extinguishing/Evacuation Sounder	Level Act. 24V DC, 1.0A max, continuous	Flashes in Activated state. ON in Released state,	Modulated DC
Number of sounders	Dependent on current consumption	See detailed explanation	
GENERAL			
Input nominal quiescent voltage, current	23.0V, 5.0mA	Current Limit	
Terminal block wire capacity	12-18 AWG		
Max number of detectors per zone	32		
Number of detection zones	2		
Total MAX number of detectors	64,		
Recommended cable parameters		SEE " INSTALLATION ", page 23	

Table 1 Technical Specifications

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Note

The TSA-200 product family MAX number of detectors per zone is 32
 The TSA-200 / TSA-200XT Total MAX number of detectors is 64 (In a two zones configuration)
 The TSA-240 / TSA-240XT Total MAX number of detectors is 128 (In a four zones configuration)

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Note

Specifications are subject to change without prior notice.

7.4 Current Calculations and Allocation

Allocating the output currents to specific ports when the CP is in Alarm is required, so devices can function correctly, while the 1.5A PS limit is not violated.

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Note

Charging is stopped in the alarm state; hence the charge current is ignored in the Alarm state current calculations.

The extinguisher has priority over other outputs, and the CP internally draws 0.16A. (See the Tech Specs above). Hence the current for the remaining devices is 1.5-0.16- extinguisher current, or 1.34A – Extinguisher current. Allocate the remaining current between the other devices, according to their priority. If the total 1.5A limit is not violated, and the maximum current drawn from of each single output is below its allowed limit, you can add devices (such as multiple sounders, strobes, etc), provided that each single output limit is not violated, and the total PS load current in the alarm state (sum of the ECD internal and load currents) does not exceed 1.5A!

7.5 Default Ports Allocation and ECD Configuration

Main Board (TSA-200MB)

Inputs

Inputs 1, 2 Detector zone (Default: **Unverified**)

Outputs:

Output 1 Fire Alarm sounder, **Silenceable**

Output 2 FARE (Fire Alarm Routing Equipment) dialer output. **Not Silenceable**

Fault Dialer (named FWRE) FWRE Output, **not delayed, not silenceable.**

MB OC

Open Collector Outputs

OC 1 Transmit the information of zone 1 alarm

OC2 Transmit the information of zone 2 alarm

MB Relays

Relay 1 General Fire Alarm Relay

Relay 2 General Fault Relay

EM1 expansion module [TSA-200XT / TSA-240 / TSA-240XT]

EM1 Inputs:

Input 3 Pressure switch

Input 4 Manual release (Manual Extinguishing Trigger)

Input 5 Inhibit (Hold/Abort) switch

Keyboard input..... Manual Only (keyboard switch on the front panel)

EM1 Outputs

Output 3..... Extinguisher, not silenceable

Output 4..... Extinguishing (EVAC)
Strb/Sounder, not silenceable

Timing parameters

Extinguishing Delay 0 seconds (No Delay)

Extinguisher Pulse Duration..... 20 seconds

Manual Release Delay No Delay

Alarm Delay (AVF) 30 seconds

Alarm Confirmation Period..... 120 Seconds

Default Passwords: Access level **2 PW is 1111**, default level **3 PW is 2222**

8 TSA-200 Product Family Control Panel Assembly

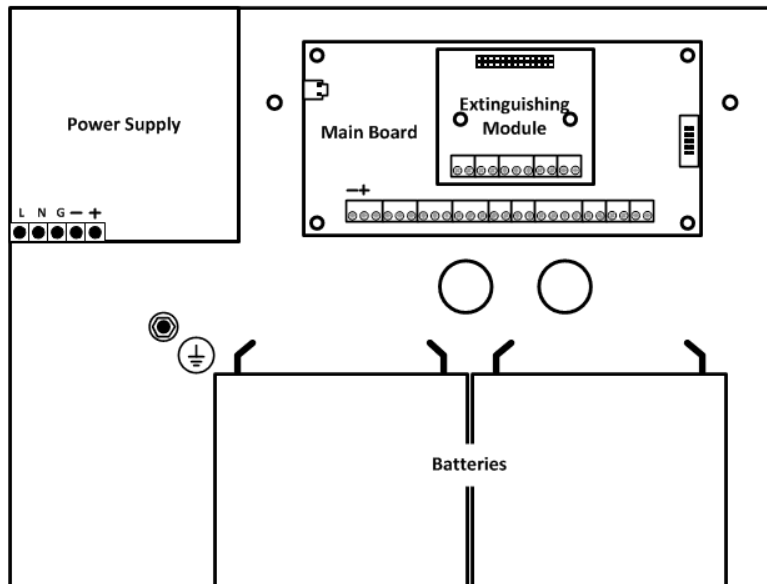


Figure 2 Module location

8.1 The Enclosure and Major Subassemblies

See Fig. 2 "Modules location" and Fig. 4, "Routing TSA-200 cables in its enclosure", for the location of major subassemblies.

THE TSA-200 product family is housed within a metal enclosure (9a box), which has a door, hinged to the right, and secured in the closed position by screws.

The door also functions as the front panel, which is comprised of a display/ keyboard unit serving as the User Interface.

The TSA-200 product family has an internal COTS Power Supply/Charger, located at the top left corner of the box, the TSA-200M main board, which has two inputs and 3 outputs, the TSA-200EM extinguishing expansion module, which has three inputs and two outputs.

i

Note

For proper operation of the extinguishing equipment, proprietary and dedicated adapters are required, as explained before.

Wiring openings knockouts allow for a bottom or top mains cable entry to the Control Panel box, and a bottom, top, or back, low-voltage cables entry.

Two 12V, 5Ah sealed Lead Acid batteries (connected in series) are positioned at the bottom of the box.

8.2 Power Supply, Charger and Batteries

The TSA-200 product family is powered by a COTS AC powered Power Supply/Charger, which is located at the top left corner of the enclosure, and provides a nominal 27.8V output. (This setting provides 27.3V battery charging voltage).

Max PS output current is 1.5A

The PS is electronically protected for Short Circuit/Over Load/Over Voltage. It does not contain user replaceable components inside

If the PS shuts down during operation, remove overload and re-power to recover.

The maximum battery charging current is 0.3A, electronically controlled and limited. The max allowed current draw from the batteries (occurs when the mains are disconnected or are OFF) is 3A, limited by a PTC element.

Type and rating of batteries;

The ECD requires two 12V, 5AH sealed Lead Acid batteries, connected in series. (Use Yuasa NP 5 -12, or equivalent)

8.3 Front Panel

The front panel, which is part of the door of the ECD box, has several visually and functionally distinctive areas, as follows:

- An 8 keys keyboard,
- A general LEDs area, comprising two columns of 7 LEDs each, where the right columns is mostly used for indicating the ECD states, and the left column is mostly used for indicating faults. The bottom two LEDs are dedicated to Password and Delay/Verify functions
- Additional Fault indication. Four LEDs are in the leftmost column, below which is the Extinguishing Zone indication Group, comprising five LEDs.
- Two Detection Zones Indications, each comprises two LEDs.
- Special indications, 2 LEDs.

9 Installation

9.1 System Installation Planning

9.1.1 Capability Planning

Verify that the total number of input initiating devices does not exceed local regulations of the number of initiating devices per zone, area or other limitations. Verify that the number of zones satisfies all the relevant requirements.

9.1.2 Calculating Current Requirement and Battery Capacity

For every control panel, calculate the total current consumption of all devices such as sounder, beacons, extinguishing cylinders actuators, Extinguishing Activated sign, automatic dialer etc... Ensure that the total current draw does not exceed 1.5A.

The batteries are rechargeable, sealed lead acid batteries, in total voltage of (Nominal) 24 volts (two 12 volt batteries in series) and capacity of 5 AH.

9.1.3 Cabling Planning – Input lines

Use a 2-wire cable, 12 – 18 AWG (0.8 to 3.3 mm²) for IDC (zone) connections.

Wire Type	Cross-Section (mm ²)	Maximum IDC Length	
18 AWG	0.82 mm	1,200 m	3,940 ft
16 AWG	1.31 mm	1,900 m	6,230 ft
14 AWG	2.08 mm	3,000 m	9,840 ft
12 AWG	3.31 mm	4,800 m	15,750 ft

Table 2 IDC cable selection

9.1.4 Cabling Planning – Output Lines and 24Vdc Out

Use a 2-wire cable, 12 – 18 AWG (0.8 to 3.3 mm²) for Output Lines and 24Vdc Out connections.

The length of output lines and 24Vdc out cabling depends on the required current and cable size. Ensure that the maximum voltage drop to the end of the line at full load does not exceed 3V and will leave the last device the minimal operating voltage as per the manufacturer's specification.

9.1.5 Cabling Planning – Shielded Cables

It is highly recommended to avoid outdoor wiring due to the increased susceptibility to lightning strikes. Overhead cables running between buildings or on roofs should be shielded. The shield should be connected to the ground by using the Master Ground Terminal in the control panel using the appropriate hardware. Grounding should not be connected to any other points. Ensure continuous grounding by soldering.

9.1.6 Activation Matrix Planning

Plan the activation logic according to the requirements in accordance with the relevant standards, regulations and mandatory requirements.

9.1.7 Extinguishing Device Planning

Size and quantity of extinguishing cylinders shall be calculated by authorized personnel in accordance to the requirements of the consultant and local regulations.

9.2 Mounting

The control panel should be installed in a closed location. Avoid exposure to outdoor environment to prevent high humidity or dust or air pollution.

Mount the CP product family to a solid wall so it will have comfortable access to connecting the cables from the input and output devices and maintenance personnel for ongoing operations and in a location where it is possible to supervise and clearly see the display and indicators.

The back of the box has several dimples. In three of these dimples there are mounting holes. Two holes close to the top of the box, and one mounting hole at the middle, close to the bottom

The two big (10mm) holes are for insertion of wires from the back of the CP, when required.

Use the drawing below as a guide for drilling the three mounting holes in the vertical surface/wall to which the CP is to be attached.

Drill the three fastening holes. Insert three anchors fully.

Insert three screws from inside the CP box through the back of the CP and tighten.

i

Note

It is not necessary to remove the PS or the MB to install the CP.

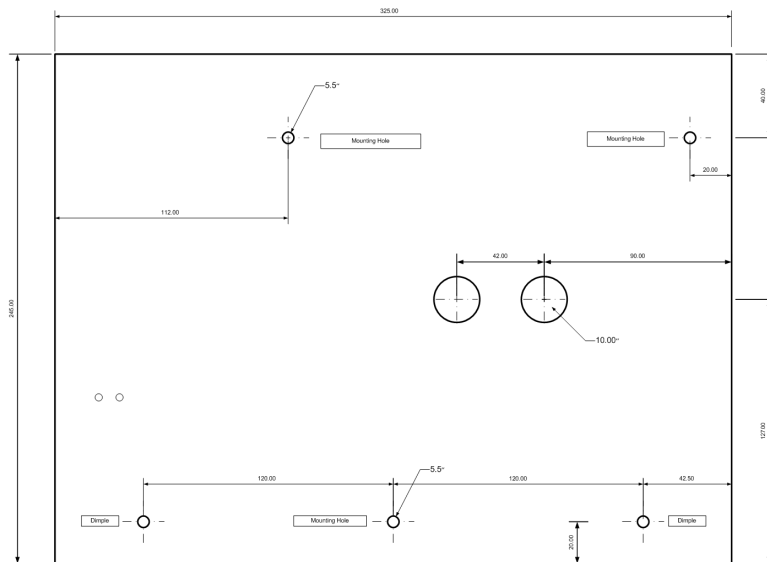


Figure 3 Chassis Mounting Holes

08/2009

9.3 Wiring

9.3.1 Routing cables into the ECD and maintaining the protection level

In order to route power and field wiring into the ECD, the appropriate, partially punched knockouts must be removed.

Use a hammer and a chisel to open and remove the knockout.

Do not remove unnecessary knockouts

Remove burrs and sharp edges.

i

Note

To maintain the IP30 protection level, use appropriately sized cable glands such as CABLE GLAND NEMA 4X PG-7 BLACK manufacture by BUD, or equivalent.

Insert the cables through the glands before connecting the wires to the ECD. Tighten the gland's cover nut to securely clamp the cable or group of field wires.

This serves as a strain relief and as means to meet the IP30 environmental protection requirements.

i

Note

If unused knockouts opening remain, they must be plugged with an appropriate, secure cover/plug to maintain the required protection level.

9.3.2 Wiring Considerations

The TSA-200 product family is supplied in working condition, fully assembled, and with all internal modules pre-wired. Wiring instructions apply only for connecting the system to AC input and connecting field wiring to inputs, outputs, and relays.

Cable type selection and wiring shall be performed according to the relevant regulations.

System connections shall ONLY be done when ALL power sources are disconnected. Changing/installing electric activation modules of extinguishers shall be done after the system is in quiescent state. (All push buttons and detectors are in non activated state, no alarm or fault).

Characteristic	Inputs	Outputs
Electric Resistance	Minimal	Very High
Capacitance	No Influence	No Influence
Inductance	Minimal	Minimal
Mechanical Strength	High	High

Table 3 Wiring Characteristics' influence on System Performance

!

Warning

Disconnect all power supplies, main and batteries before connecting or disconnecting wiring and cables to the control panel.

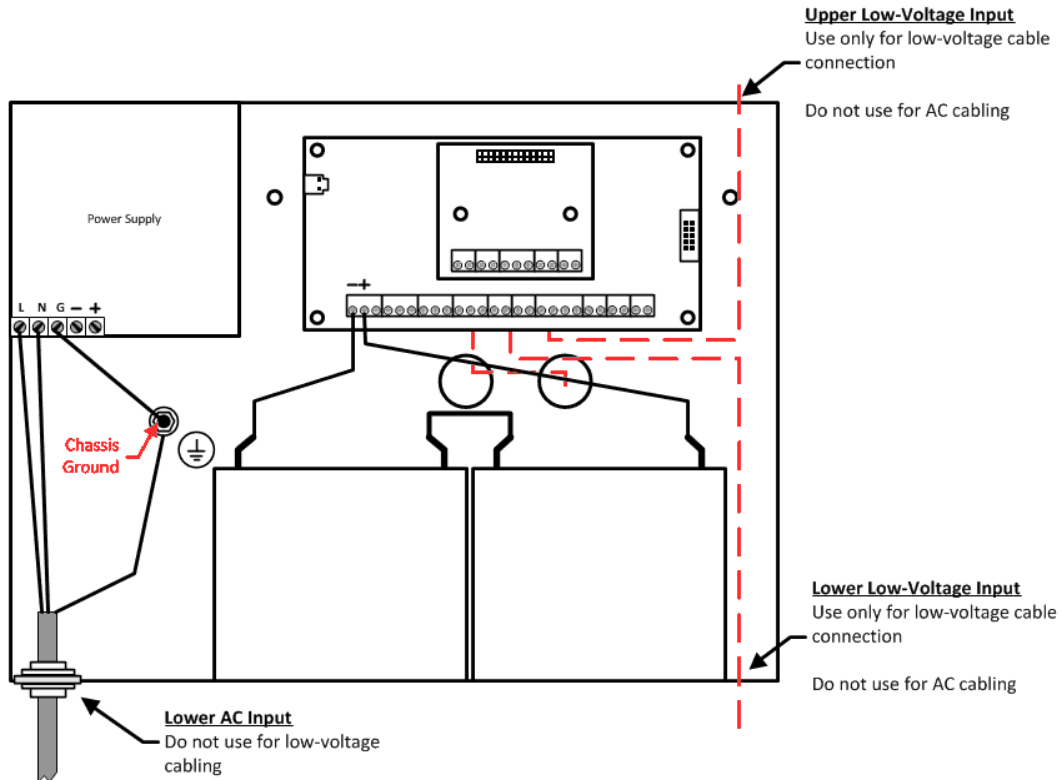
9.3.3 Inputs Wiring

Inputs wiring for detectors and push buttons shall be with a two-wire cable according to the applicable regulations.

In industrial installations which have machines which produce high power electromagnetic fields, use shielded cables.

Detector and input wiring shall be in a separate conduit from mains conduit.

The wiring cables and input and system output shall be separate from mains AC input – see below



02/2011

Figure 4 Routing cables in the TSA-200 product family Enclosure

9.3.4 24Vdc Powered Devices

To ensure operation of alarm or initiating device that requires relatively high current from a 24 Vdc source, use appropriately sized cables.

Wire specifications should be between 12 and 18 AWG, and the cable resistance running between the 24 Vdc source to the I/O module and from the I/O module to the device should be calculated. Ensure that no device receives a voltage below its specified minimum operating value, and that the total voltage drop does not exceed 3 volts.

Calculate the total current drawn by the system and system devices at normal operation and alarm modes. Ensure that the total load on the power supply does not exceed its limit of 1.5 Ampere.

9.3.5 Output Wiring

Activation circuit cabling between the 24Vdc source to the output device such as sounders, extinguishing devices, strobes, etc., shall be calculated to a maximum voltage drop of 3V or a voltage drop that will leave the device with the lowest operating voltage specified by the manufacturer – the lowest voltage drop of the two.

i

Note

Input and output lines must be wired as a single radial circuit, without stubs or T- junctions.

!

Warning

Disconnect all power supplies, (main and batteries) before connecting or disconnecting wiring EOL devices or other devices to the control panel.

Verify that the system operates normally (Idle) and that there are no alarms prior to connecting or replacing extinguishing devices.

9.4 End of Line Resistors

For proper operation, End of Line (EOL) resistors must be connected to most I/O lines.

The value for the TSA-200 product family EOL resistor is 3.9K.

ALL THE INPUT AND OUTPUT LINES, USED OR UNUSED, MUST BE TERMINATED PROPERLY.

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Note

DO NOT CONNECT EOL RESISTORS TO RELAYS OUTPUTS AND 24V OUTPUTS.

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Note

Most extinguishing adapters have on-board EOL resistors, so no additional EOL resistors are required. Verify EOL requirements for each specific extinguishing adapter.

9.5 Removing and Installing EOL Resistors

Remove EOL resistors from the terminal block before connecting field wiring. After field wiring is finished and all devices are connected, connect the End of Line resistors (E.O.L.) to the last device of each Input or output which requires EOL termination.

9.6 Installation of Detectors and Manual Call Points

Install all detectors and manual call points (IF ALLOWED BY LOCAL REGULATIONS) at their locations according to the applicable regulations.

i

Note

Manual Call Points act like Detector inputs
THEY ARE NOT MANUAL RELEASE (EXTINGUISHING TRIGGERING) DEVICES.

i

Note

Input and output lines must be wired as a single radial circuit, without stubs or T-junctions.

Test all wiring and fix all faults before connecting devices to the ECD.

9.7 Connecting the Interfaces

Shown below is the label attached to the inside of the ECD's door

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Note

Always fill and update the Extinguishing Delay and Extinguishing duration in the allocated space of the label

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Note

In the following drawings, and in the TSA-200 product family labels and PCB silk-screen, Open Collector (OC) outputs are shown as Z1 (Zone 1) and Z2 (Zone 2).

OC1 is the Z1 is the output, and OC2 is the Z2 output.

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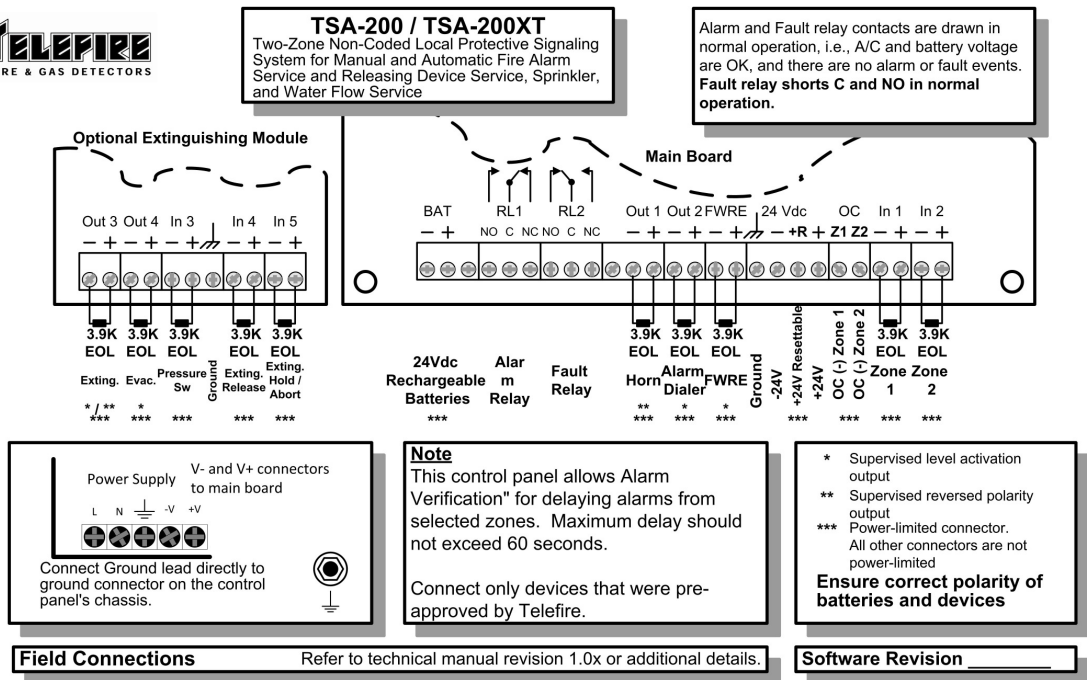
Note

Do not work on the ECD unless all power to the control panel is disconnected (AC and batteries disconnected).

!

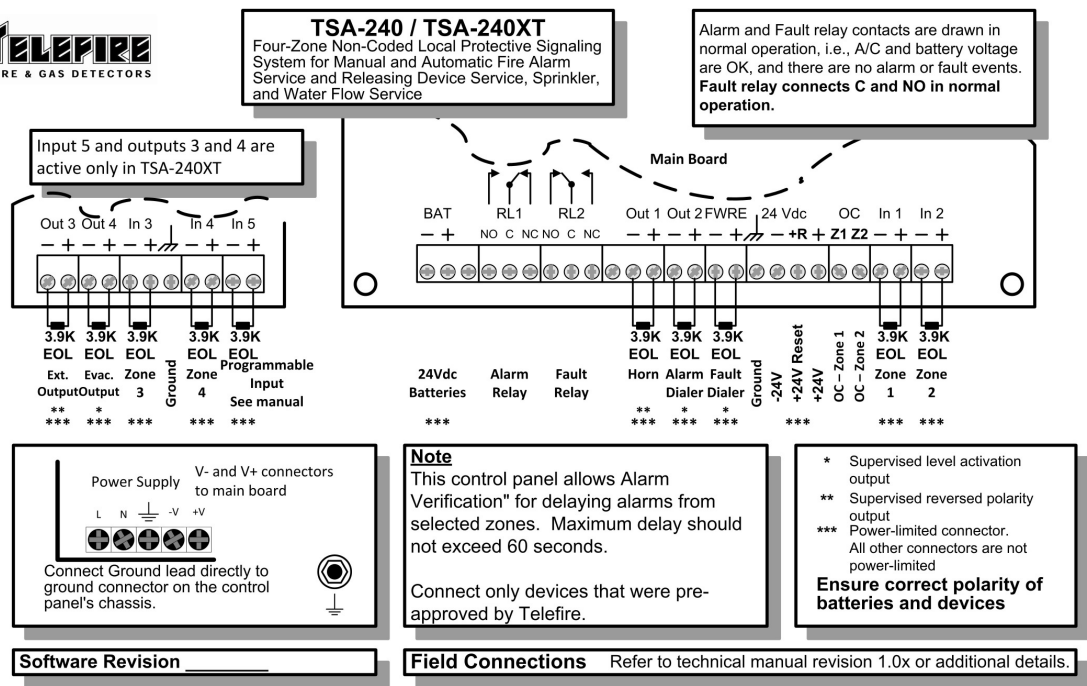
Warning

Do not connect the extinguishing activation circuits at this time. Use a dummy load.



TSA-200 / TSA-200XT Field Connections 06/2014

Figure 5 TSA-200 / TSA-200XT Connectors Label

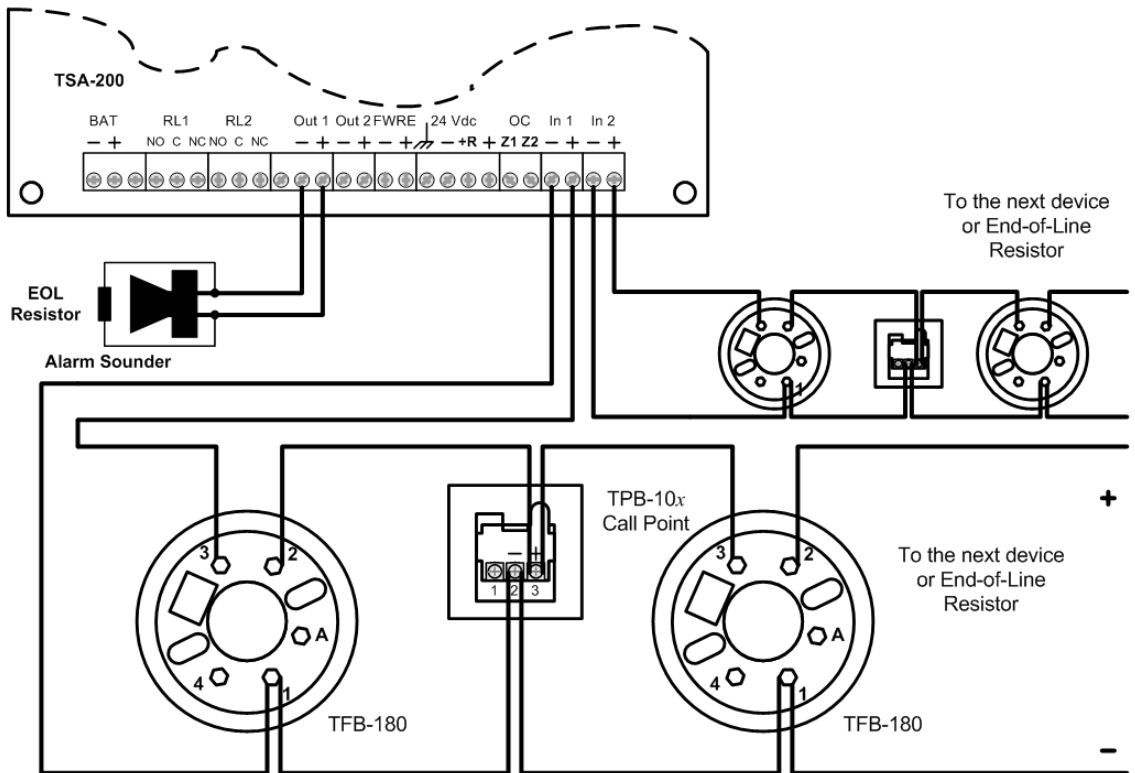


TSA-240 / TSA-240XT Field Connections 06/2014

Figure 6 TSA-240 / TSA-240XT Connectors Label

Connect the inputs, 24 volt output and control panel outputs (dialer, horn, etc.) to the control panel. Do not connect the Extinguisher yet

9.7.1 Typical Fire Alarm, Non Extinguishing Connections



11/2010

Figure 7 Typical Fire Alarm, (Non Extinguishing) Connections

The figure above shows a typical, Fire Detection and Alarm, TSA-200 application.

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Note

THIS IS A NON EXTINGUISHING EXAMPLE!

The EM1 module is not shown.

It shows the TSA-200 Main Board connected to two zones, where in each zone detectors and Manual Call Points (MCP) are shown. Also shown is a Fire Alarm Device (alarm sounder, typically a horn), battery input lines and other lines are omitted for clarity.

9.8 Connecting the Mains Power and Batteries

SEE [SAFETY](#), page 9

SEE [Routing cables into the ECD and maintaining the protection level](#), page 9.

9.8.1 Connecting AC power and ground wires

Connect the control panel's AC input cable directly to a dedicated circuit breaker that is not shared by other appliances or equipment. It is recommended that the circuit breaker shall be labeled "FIRE ALARM".

Use a three wire cable (Line, Neutral and Ground wires) of the appropriate gauge and colors

Verify that all power sources to the ECD are disconnected.

Disconnect the ECD AC cable from the mains, so that the ECD ends of the wires can be handled safely.

Insert the AC input power cable to the control panel enclosure through either the top left or bottom left knockout opening and keep it separated and distant from the field wiring and the control panel circuits.

Use appropriate bushing/grommet that fits the knockout openings, to ascertain that there are no sharp edges, to prevent damage or abrasion to the cable during assembly and use.

Remove the PS terminals protective cover (RED) and keep it and its screw for reassembly

CONNECT THE GROUND WIRE OF THE AC INPUT CABLE (Yellow Green wire) and the (short) Yellow/Green PS ground wire DIRECTLY THE PANEL'S CHASSIS GROUND SCREW, USING SERRATED WASHERS AS SHOWN.

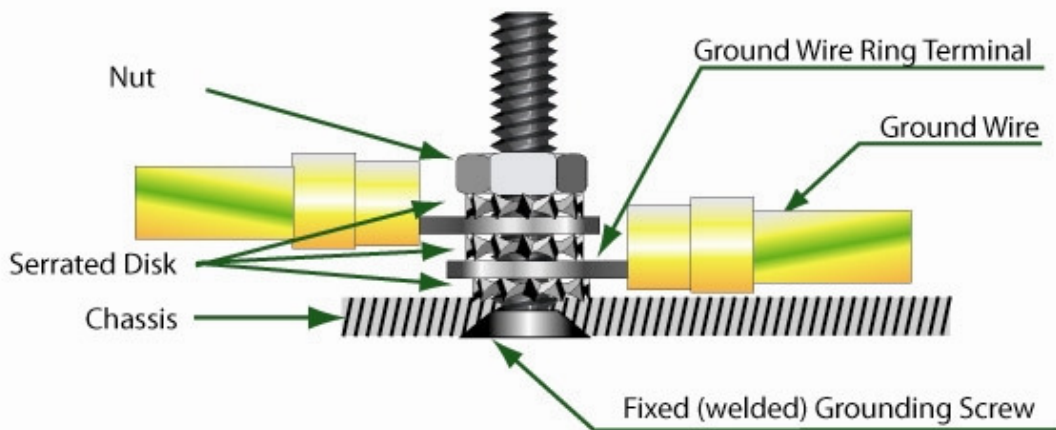


Figure 8 Connecting the grounding wires to the Chassis

Connect the end of the PS (short, Yellow /Green) GND wire to the PS GND terminal
Then connect the Line and Neutral wires to the proper PS terminals. Tighten the terminal block screws.

9.8.2 Connecting the batteries

Place and connect batteries in the Control Panel, only after the Control Panel is properly installed and is in the correct (upright) position.

Place batteries so they are adjacent to the back of the Control Panel enclosure, with the batteries terminals in the UP (TOP) position, as shown in the appropriate drawings in the TM.

Place protective covers on batteries' terminals when the battery wires are disconnected from the battery.

Remove batteries (after assembling protective terminals covers) from the CP before moving the Control Panel.

Place the batteries in the allocated space, at the bottom of the box. Connect the supplied link wire between the two batteries. Connect the red sleeved end to the positive terminal of one battery, and the black sleeved side of the wire to the adjacent negative terminal of the second battery.

Connect the long Red wire to the POSITIVE "+" free terminal of one battery and to the "+bat" terminal block (on the MB), and the long, black wire to the free NEGATIVE "-" terminal of the battery and the "-bat" terminal block (on the MB)

Observe Batteries' polarity. Wrong connection can cause damage to the ECD.

Assemble the protective PS terminals cover plate and tighten the screw.

Connect the two wires PS output cable to the PS +V and -V terminals respectively.

Attach the two pins connector to the 2 pin header on the MB. Secure the cable with a tie-wrap as shown

VERIFY THAT THE ECD IS PROPERLY GROUNDED BEFORE CONNECTING AC POWER TO THE ECD.

Connect AC input power

Verify that the ECD is working properly; Power led is ON and flashes briefly.

9.9 Verifying Termination

Verify that all the lines and devices requiring EOL resistors are properly terminated.

10 Post-Installation

10.1 Configuring the Control Panel

The ECD is delivered in a default configuration (see [Default Ports Allocation and ECD Configuration](#), page 19.)

Modify only if necessary, by programming the ECD, as explained in [Control Panel Configuring and Programming](#), page 57

10.2 Field Test

Perform a field test – this test allows a single operator to perform a test for all field devices, including detectors, call points, and other inputs.

The testing process is automatic except for activation of the device which is done manually by means specified by the device's manufacturer.

Telefire's devices can be tested by putting a magnet to the test point of the detectors or activation of the call points through the testing tool (supplied with the call point).

10.3 Outputs Test

Test the outputs of the system to ensure that they are activated properly

10.4 Arming the Extinguishing device

Arm the extinguishing devices.

i

Note

The Control and Indicating Equipment (CIE) is now fully functional, and, with the proper alarm conditions, the extinguisher will be activated.

10.5 Change Password

It is recommended to change the system's passwords from their default values after completing the installation and system testing. See [Changing the Password](#), page 62

!

Warning

If the passwords are changed from their default values and then forgotten or lost, A factory reset is required: if you lose or forget the password, the panel must be sent back to the factory to be reset. There is no field option for gaining access to the panel without a valid password.

Once you have changed the password, it is important that you write it down somewhere and store it in a known and safe place.

10.6 System Additional Documentation

Attach the followings to the system's front panel, or place it in a prominent position nearby:

- A list of areas/zones as installed in the protected premises
- Actions to be taken by the operator upon events of alarm or fault

- The name and telephone number of the installing company and of the service representative should be clearly marked on the panel itself or on an attached document

See a sample document at the end of this manual.

10.7 Connecting a TDM-500i Dialer

10.7.1 Dialer Configuration

Verify that dialer software version is revision 2.01.08 or higher (see label on TDM-500i). Press **Prog** – the display shall show "_." enter the password (default **2222**). The display shall show **P**.

Press **1**. The display shall show **d**.

Press	Display	Configuration	Range	Default
6	–	Selection of A and B input polarity: 11 – A positive, B positive (This option exists only from software revision 2.05.01)	00 – 11	01

Configure the dialer for positive activation of both input A and input B (11).

10.7.2 Dialer Connection

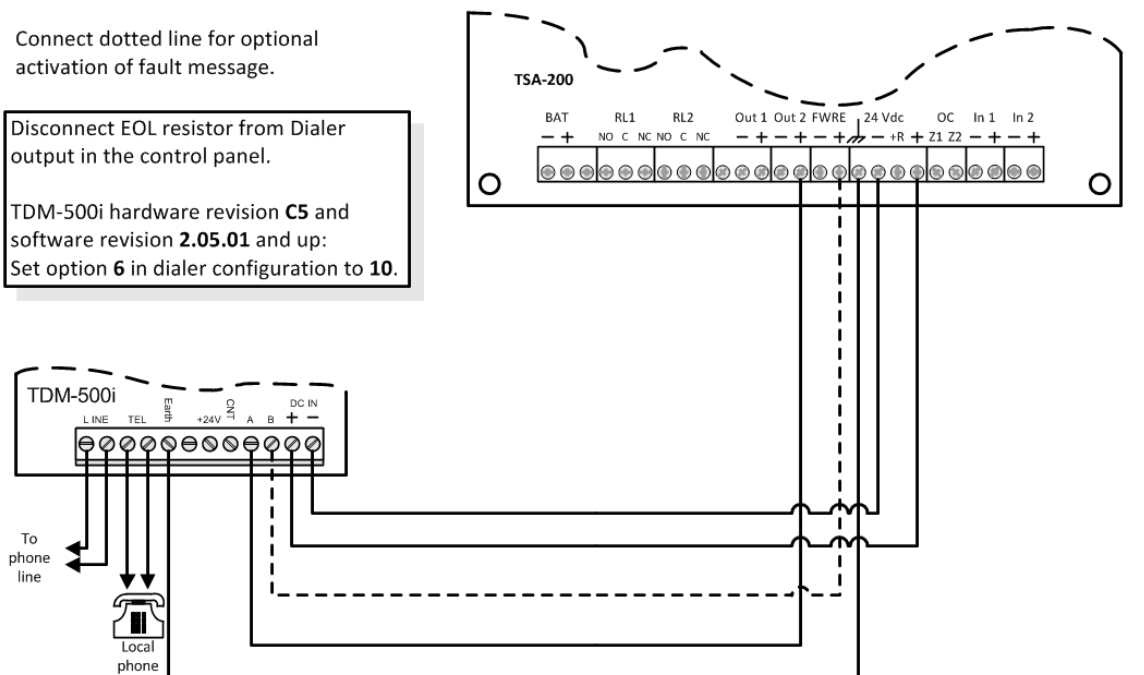


Figure 9 Connecting a TDM-500i Dialer (H/W rev C5, S/W rev 2.05.01 or higher)

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Note

The dotted lines in Figure 9 are required only for error message notifications.
Configure the dialer (option 6) to 11.

11 Extinguishing

11.1 Adding Extinguishing Capability

The basic TSA-200 (MB Only, no expansion module) is a CIE (Control and indication equipment.) or, using another term, Fire alarm and detection device, or a FACP, A Fire Alarm Control Panel

Installing the EM1 extinguishing expansion module modifies the TSA-200 into the TSA-200XT, CIE/CDE (Control and Indication Equipment/Control and Delay Equipment), or a Fire Alarm and EXTINGUISHING Control Panel.

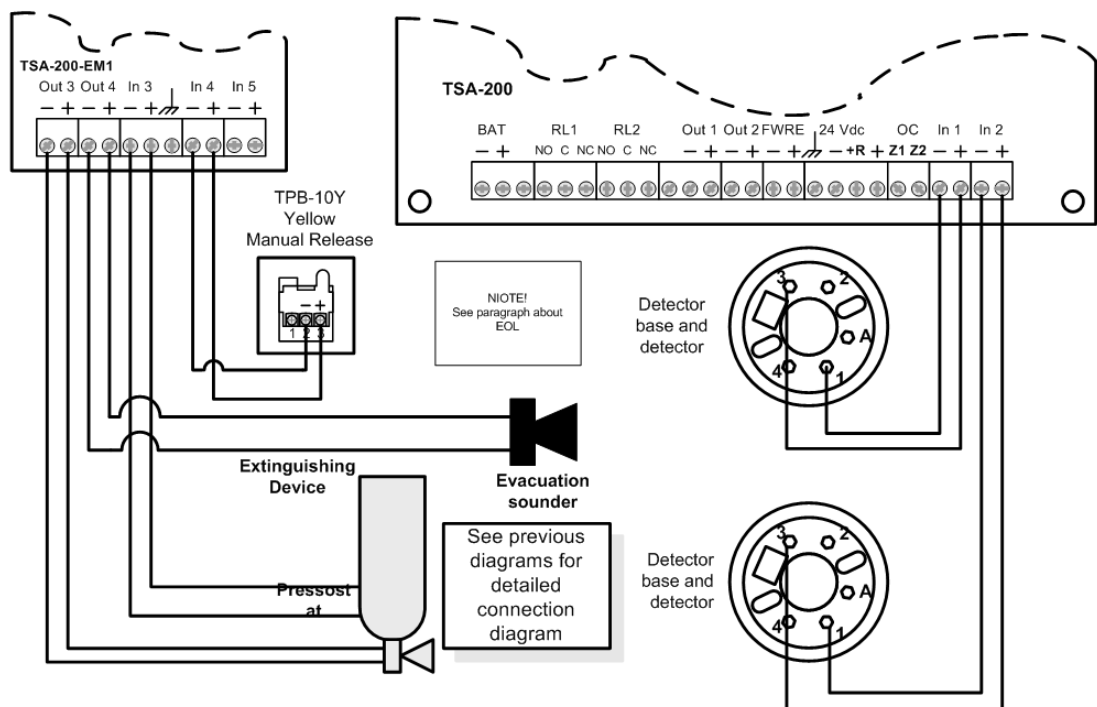
The resident software detects the EM! Presence and adapts to it

Note! The EM1 and the EM1 Rev 1.1 have the same terminal block connection. The differences are INTERNAL ONLY.

11.2 A Typical Application-Fire Extinguishing

The following example shows a TSA-200XT that is connected to two detection zones, a Manual Triggering Device (Push Button), a pressure switch input, an Evacuation sounder and an extinguisher. A Fire alarm device is not shown, nor are extinguishing adapters shown.

EOL resistors are not shown, but ARE REQUIRED FOR PROPER OPERATION



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Figure 10 A typical application – Extinguishing

11.3 Extinguishing Adapters

In order to connect the ECD extinguishing output to different actuators, it is necessary to connect adapters between the ECD output and the extinguishing device input.

Telefire Ltd. offers several such adapters.

Shown below is a table of the of equipment and the number and type of relevant adapter:

i

Note

When adapters are installed, addition of EOL resistors is not required!

i

Note

Please consult the manufacturer for solutions regarding activation of additional extinguishing devices.

11.4 Type and Number of Extinguishing Adapters

Extinguishing Device	Maximal number of extinguishing adapters
SAFE solenoid gas cylinders	A single TLA-110 adaptor connected to the extinguishing output
FIKE solenoid gas cylinders (FIRERASER)	A single TLA-130 adaptor connected to the extinguishing output
FIKE GCA gas cylinders	A single TLA-22 adaptor connected to the extinguishing output
FirePro aerosol generators	A single TLA-44/1 or TLA-44/4 adaptor connected to the extinguishing output
GreenEX aerosol generators	A single TLA-33 adaptor connected to the extinguishing output

i

Note

Connect a single extinguishing adaptor to the extinguishing activation output. This adaptor will activate a single extinguishing device, except for the TLA-44/4 that can activate up to 4 FirePro aerosol extinguishers.

Please consult Telefire Ltd. for solutions regarding activations of additional extinguishing devices

11.5 Gas Extinguishing – SAFE Solenoid-Operated Gas Cylinders

The TSA-200XT / TSA-240XT can activate a SAFE solenoid-operated gas cylinder via a TLA-110 extinguishing adapter

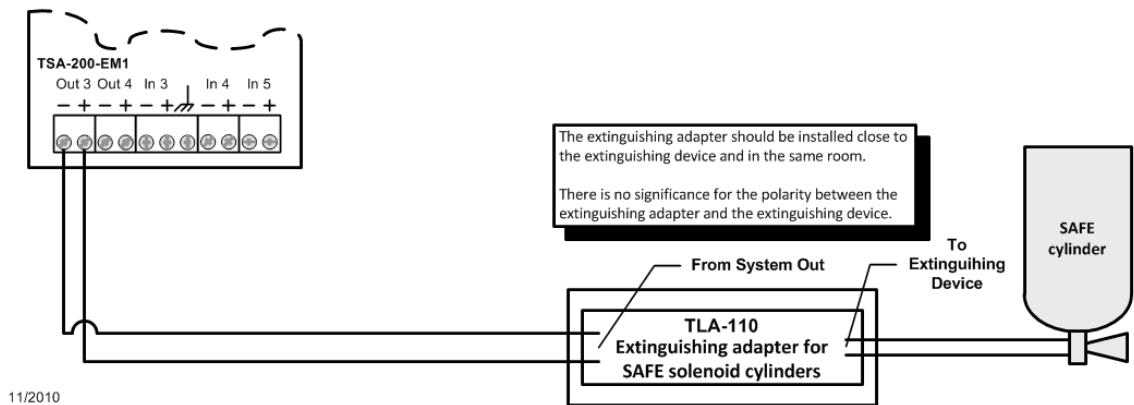


Figure 11 Connecting a SAFE solenoid-operated gas cylinder

11.6 Gas Extinguishing – FIKE Solenoid-Operated Gas "FIRERASER" Cylinders

The TSA-200XT / TSA-240XT can activate a FIKE solenoid-operated gas "FIRERASER" cylinder via a TLA-130 extinguishing adapter

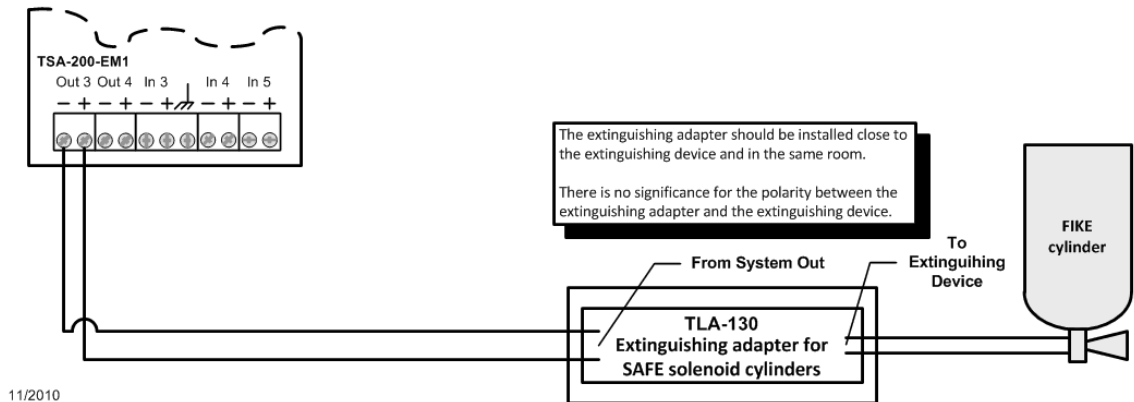
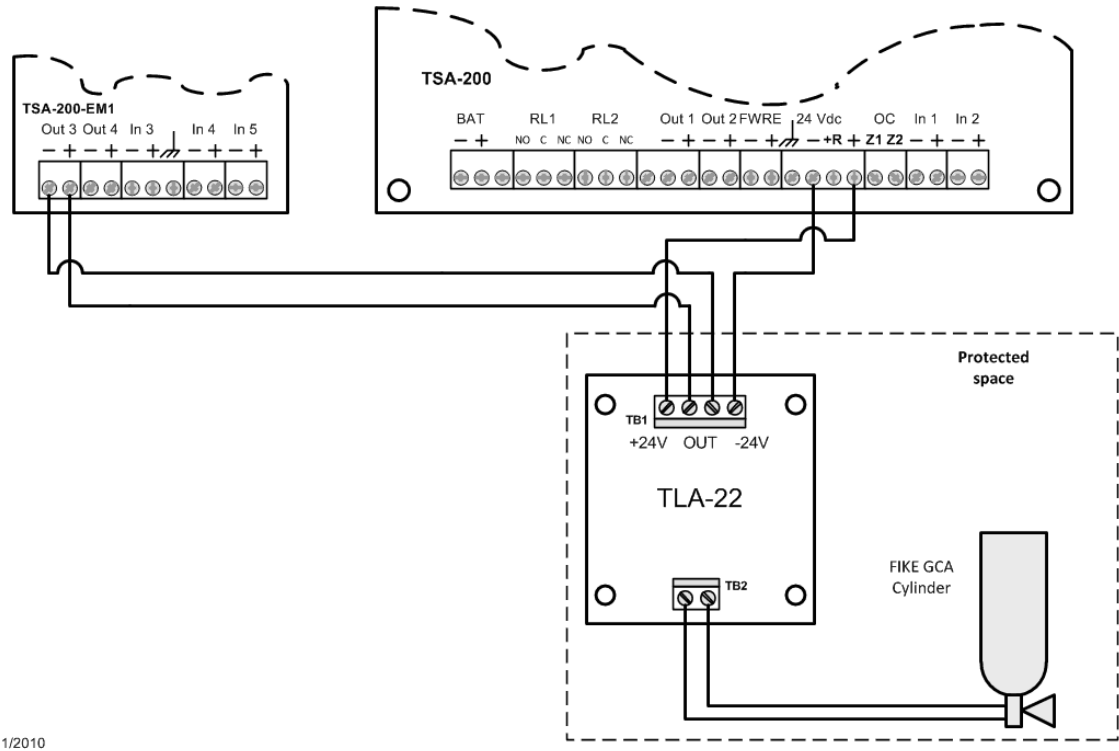


Figure 12 Connecting a Fike solenoid-operated gas FIRERASER cylinder

11.7 Gas Extinguishing – FIKE GCA- Gas Operated Cylinders

The TSA-200XT /TSA-240XT can activate a FIKE GCA-operated gas cylinder via a TLA-22 extinguishing adapter



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Figure 13 Connecting a Fike GCA-operated gas cylinder

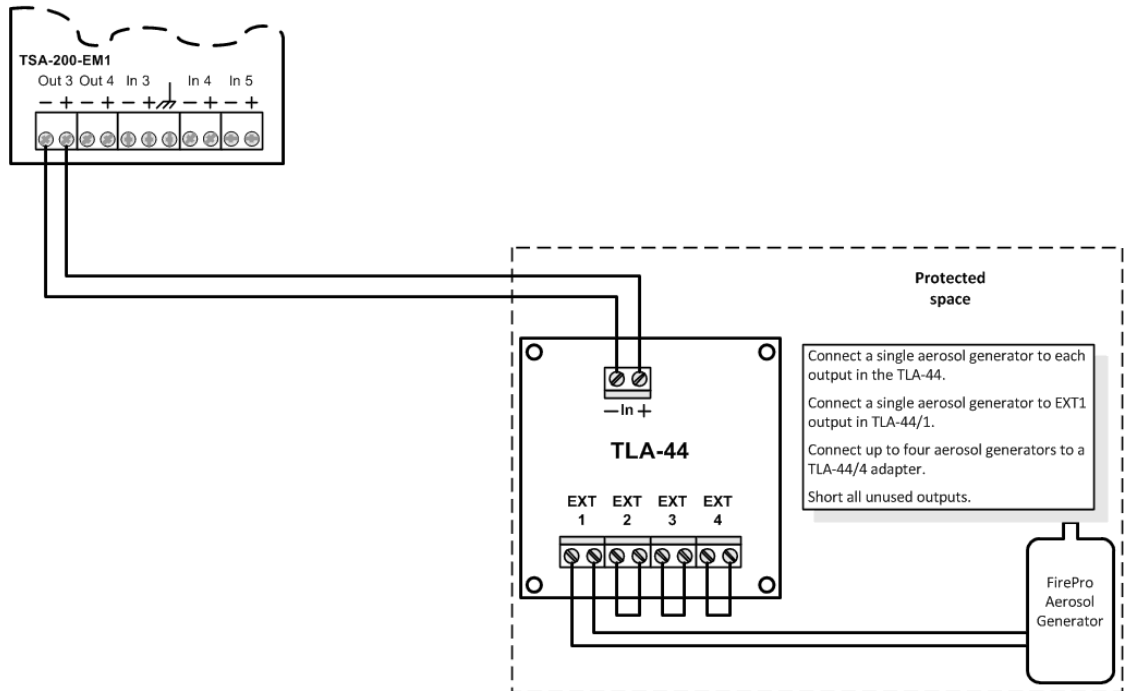
11.8 Aerosol Extinguishing – FirePro Aerosol Generators

The TSA-200XT / TSA-240XT can activate a FirePro aerosol generator via a TLA-44 extinguishing adapter. It is possible to connect up to four generators via the TLA-44/4 extinguishing adaptor.

The TLA-44 module is intended to work with FirePro aerosol units. It is available in two configurations that allow for connecting either a single module or up to four modules.

- TLA-44/1 – allows activation of a single module
- TLA-44/4 – allows activation of up to four modules

Activation is simultaneous to all aerosol devices connected to the TLA-44. The module's output lines to the aerosol devices are supervised for open circuit.

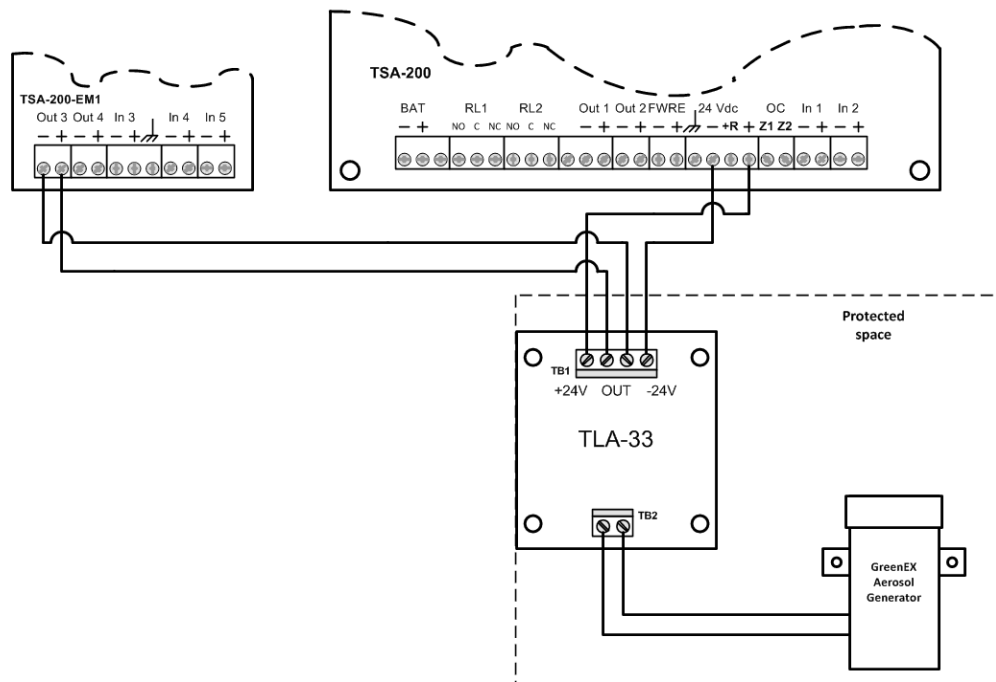


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Figure 14 Connecting a FirePro Aerosol Generator

11.9 Aerosol Extinguishing – GreenEX Aerosol Generators

The TSA-200XT /TSA-240XT can activate a GreenEX aerosol generator via a TLA-33 extinguishing adapter.



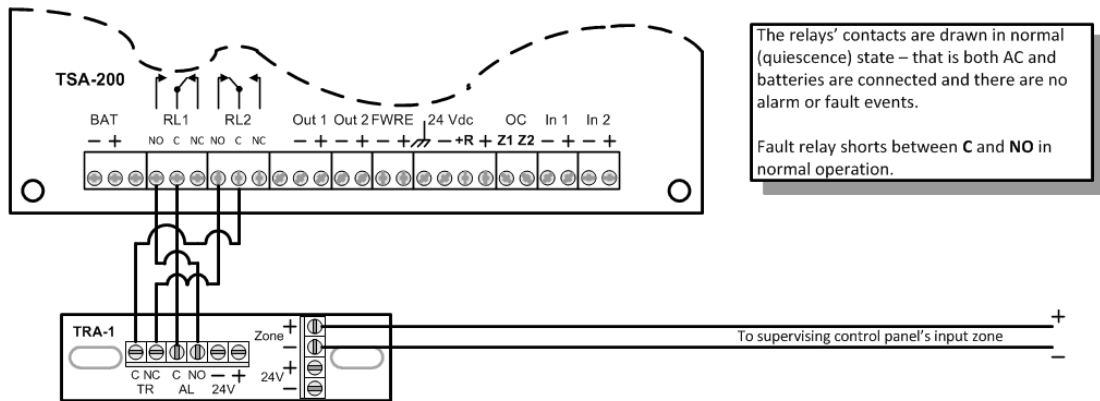
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Figure 15 Connecting a GreenEX aerosol generator

11.10 Connecting to a Supervising Control Panel

In certain cases, there is a requirement to connect the TSA-200 product family to a supervising control panel. It is possible to connect the TRA-1 adapter module to the TSA-200 product family Alarm and Fault relays, to a zone in a conventional control panel or an input module (ADR-812 or ADR-818), which are connected to an ADR-3000 analog addressable control panel.

The adapter simulates the behavior of a regular detection zone.



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Figure 16 Connecting a TSA-200 product family to a supervising control panel

12 User Interface-Display and Keyboard

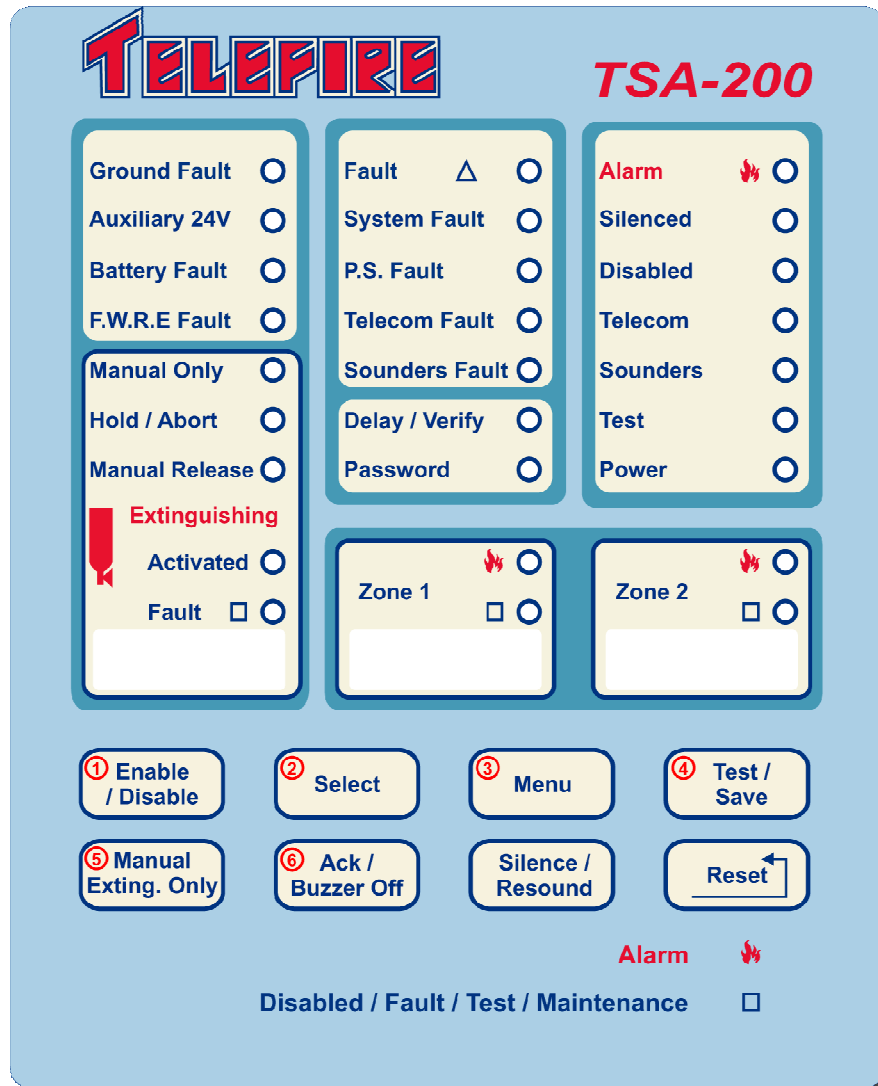


Figure 17 Front Panel

Display and keyboard

The display is made up of a 27 single LEDs (Three columns of 9 LEDs each), each indicating a condition, status or event.

The keyboard has 8 keys.

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Note

The 5 Left bottom LEDs are the Extinguishing Zone group LEDs, which are not functional in the TSA-200 / TSA-240, as it has no extinguishing module assembled, but are active in the TSA-200XT / TSA-240XT.

13 Display

13.1 General Display Area

The general display area is shown and explained below.

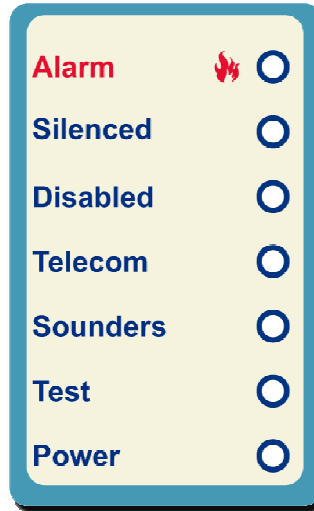


Figure 18 General Display Area

13.1.1 Acknowledge of an Indication

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Note

The Display Logic of the TSA-200 product family is that of UL 864, where most events are indicated by flashing indicators, changing to ON (steady) indication when acknowledged. This is explained in the text below.

If a 12094 certified CIE/CDE (Extinguishing Control Panel) is required, please consult Telefire LTD about the TSA-200X and other products.

With the TSA-200, some events cause the relevant LED to flash, and some cause the relevant LED to switch ON.

The flashing LEDs indications require an acknowledgement.

Pressing the "Ack/Buzzer OFF" key causes the "Password" LED to flash quickly. (This is done to request the user to enter the operator's password, default value 1111.).

Entering the correct password causes the LED to switch ON (i.e. stop flashing), and silences the buzzer.

The same procedure is used for most events where an indication LED flashes.

LED	Its Color and Function
Alarm	Red LED. Flashes during alarm. Pressing the Ack/ Buzzer OFF key, causes the 'Password" LED to flash quickly, and then after keying-in the Operator's password switches the LED ON steadily and silences the internal buzzer.
Silenced	Yellow LED. Flashes during alarm when the horn is silenced.
Disabled	Yellow LED. ON when one or more of the inputs or outputs is disabled.
Telecom	Red LED. ON when the fire alarm dialer was activated
Sounders	Red LED. ON when the Fire Alarm Sounder(s) (Horn) are activated. (Off when not activated or silenced).
Test	Yellow LED. ON when the CP is in the "Test" mode.
Power	Green LED. Indicates the presence of the two input power sources, AC mains power and battery power. <ul style="list-style-type: none"> ON with short OFF pulses when the mains AC and the battery power are both OK. Flashes quickly when there is no main power.

13.2 Fault Display Area

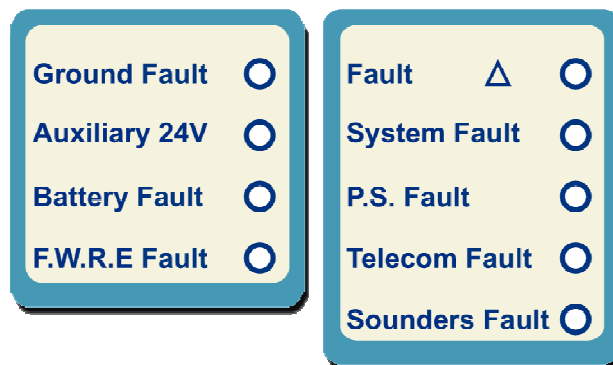


Figure 19 Fault Display Area

LED	Its Color and Function
Fault	Yellow LED. Flashes to indicate a general fault in the CIE/ECD. The specific zone or device fault LED also flashes. Pressing Ack/Buzzer Off and entering the Operator's password switches the General Fault LED and the specific Fault LED ON steadily, and silences the buzzer.
System Fault	Yellow LED. Flashes every 1.6 seconds to Indicates a system fault, such as hung processor.

LED	Its Color and Function
P.S. Fault	Yellow LED. Flashes to indicate a power supply fault or loss of AC input power. Pressing Ack/Buzzer Off and entering the operator's password switches the LED (and the general fault LED) ON steadily and silences the buzzer.
Telecom Fault	Yellow LED. Flashes to indicate an Alarm Dialer (FARE) fault. Pressing Ack/Buzzer Off and entering the operator's password switches the LED (and the general fault LED) ON steadily and silences the buzzer.
Sounders Fault	Yellow LED. Flashes to indicate an Alarm Sounder (Horn) fault. Pressing Ack/Buzzer Off and entering the operator's password switches the LED (and the general fault LED) ON steadily and silences the buzzer.
Ground Fault	Yellow LED. Flashes to indicate a ground fault. Pressing Ack/Buzzer Off and entering the operator's password switches the LED (and the general fault LED) ON steadily and silences the buzzer.
Auxiliary 24V	Yellow LED. Flashes to indicate an Auxiliary 24V or Auxiliary 24V_Resettable fault. Pressing Ack/Buzzer Off and entering the operator's password switches the LED (and the General Fault LED) ON steadily and silences the buzzer.
Battery Fault	Yellow LED. Flashes to indicate battery fault. Pressing Ack/Buzzer Off and entering the operator's password switches the LED (and the General Fault LED) ON steadily and silences the buzzer.
F.W.R.E Fault	Yellow LED. Flashes to indicate a FWRE (Fault Dialer) fault. Pressing Ack/Buzzer Off and entering the operator's password switches the LED (and the general fault LED) ON steadily and silences the buzzer.

13.3 Miscellaneous Display Area



Figure 20 Miscellaneous Display Area

LED	Its Color and Function
Delay/Verify	Yellow LED. <ul style="list-style-type: none"> Flashes when one of the zones, which is configured for alarm verification, is triggered and is in the alarm delay or alarm confirmation period. Flashes during the extinguishing delay

LED	Its Color and Function
Password	Yellow LED. <ul style="list-style-type: none"> Flashes quickly to indicate that a password is required. ON after correct password is keyed in.

13.4 Zone Indicators

Each zone has 2 LEDs in the zone indication area that inform the user that there is an Alarm or a Disabled/Fault/Test/Maintenance event in that zone.

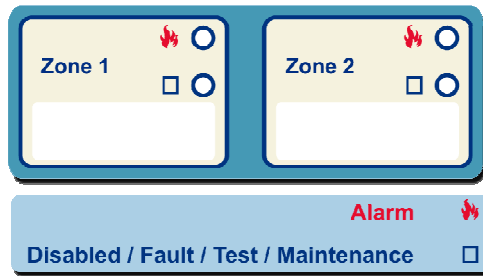


Figure 21 Zone Indicators

LED	Its Color and Function
Alarm	Red LED. <ul style="list-style-type: none"> Flashes to indicate an Alarm in that zone. (The general Alarm LED flashes also). Pressing Ack/Buzzer Off and entering the operator's password switches the LED (and the general Alarm LED) ON steadily and silences the internal buzzer. Flashes with short on periods if the zone is triggered and is in the alarm delay/alarm confirmation period
Fault / Disabled / Test	Yellow LED <ul style="list-style-type: none"> Flashes when the zone is in fault until pressing the Ack/Buzzer OFF key. Pressing the Ack/Buzzer Off key and entering the password stops the LED flashing, and switches it ON until fault resolution. ON when the zone is in the Supervisory, Disabled or Test condition.

13.5 Keyboard

The keyboard has 8 keys. The table below explains the function of each key. Some keys are dual function, and are used to enter numeric values. The dual function keys are those with circled red numbers.

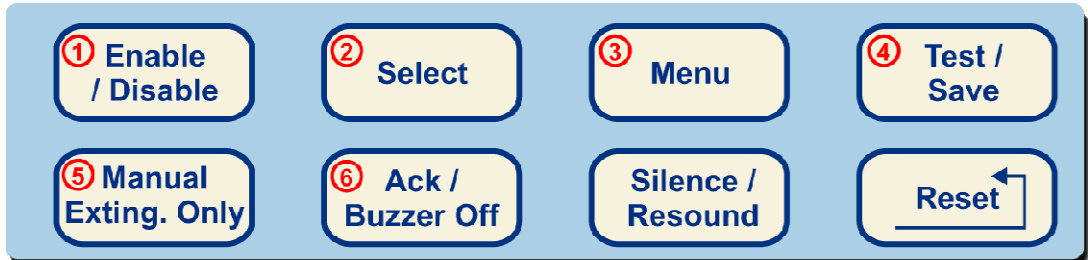


Figure 22 Keyboard

Key	Function
Enable / Disable	<ul style="list-style-type: none"> Enables or disables an input or output Enters the numeric value "1"
Select	<ul style="list-style-type: none"> Allows to change the options in the selected field Enters the numeric value "2"
Menu	<ul style="list-style-type: none"> Enter programming mode Enter the numeric value "3"
Test / Save	<ul style="list-style-type: none"> Used for Lamp Test Used to save programming options in permanent memory Used to enter the numeric value "4"
Manual Exting. Only	<ul style="list-style-type: none"> Allows the selection of extinguishing activation mode, (automatic & manual, or manual only), which is not supported in the TSA-200 / TSA-240, but is supported in the TSA-200XT and TSA-240XT Used to enter the numeric value "5"
Ack / Buzzer Off /	<ul style="list-style-type: none"> Purpose: Acknowledge/ Buzzer Off Used for silencing the internal buzzer Acknowledges a new event. Pressing this key and entering the Operator's password stops the LED flashing (flashing indicates a new events) and switches it ON Used for computer printing Used o enter the numeric value "6"
Silence / Resound	<ul style="list-style-type: none"> Used for silencing the Fire Alarm horns. Devices connected to the Horn output are switched OFF. A long press will re-sound the output

Key	Function
Reset	<ul style="list-style-type: none"> Used to reset alarms and return the system to normal operations after an alarm. All outputs of the Control and Indicating Equipment (CIE) and inputs to the system are returned to normal operation. The system shall return to alarm or fault state during additional events Used for exiting the menu or programming state.

13.6 Extinguishing Display Area

The Extinguishing Zone Display area is active for TSA-200XT and TSA-240XT , a fire Alarm and extinguishing control panels.

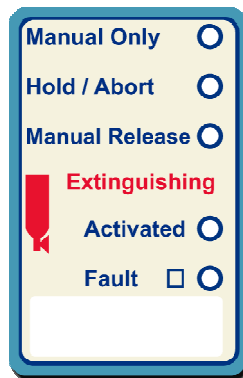


Figure 23 Extinguishing Display Area

LED	Its Color and meaning during normal operation
Manual Only	Yellow LED. <ul style="list-style-type: none"> Off in the Manual and Automatic mode On when the control panel is programmed to the Manual Only mode. In this mode extinguishing will not be activated by the detection zones trigger, but only from the manual activation input (In 4, Manual Trigger PB).
Hold/Abort	Yellow LED. <ul style="list-style-type: none"> Flashes when the Hold input is activated (asserted). Constantly ON after Acknowledge – until the extinguishing process is complete
Manual Release	Red LED. <ul style="list-style-type: none"> Flashes when the Manual Release input is activated. Constantly ON after Acknowledge

LED	Its Color and meaning during normal operation
Activated	<p>Red LED.</p> <ul style="list-style-type: none"> • If extinguishing delay is programmed ON, the LED flashes during extinguishing delay count-down (Pre Discharge Warning Time). • ON during the extinguisher pulse duration period, OFF when the extinguishing pulse ends.
Fault	<p>Yellow LED.</p> <ul style="list-style-type: none"> • Flashes when there is a fault in any of the extinguishing module's inputs or outputs, changes to ON when acknowledged, and stays ON until the faults are resolved and Reset is performed. A dedicated LED next to the input or output TB in the EM1 extinguishing module is also ON. • Flashes after the extinguishing pulse ended to indicate that there is a need to refill or replace the extinguisher media container. The General Fault LED flashes also. Can be switched OFF by entering and exiting the programming mode.

14 Work States

During an alarm or fault events and states of the system, the event/states are clearly shown by dedicated LEDs that are labeled **Fire Alarm** or **Fault**, respectively.

Fire alarms have a higher priority than fault events and are shown first.

14.1 Normal State

Normal (Quiescent, Idle) state is a state where no alarm or fault event exists and all of the inputs and outputs are enabled. In this state, the green Power LED is ON with short OFF pulses.

14.2 Alarm State

14.2.1 Dependency on More Than One Alarm Signal (Alarm Delay)

The Dependency on more than one alarm signal (alarm delay and verification) feature allows the Control and Indicating Equipment (CIE) to ignore false alarms.

When a zone is programmed for alarm delay verification, and an alarm is received in that zone, the Control and Indicating Equipment (CIE) resets the zone in alarm, waits for 0 or 30 seconds (depends on individual zone programming) and rechecks for 120 seconds (confirmation period) whether the same zone is still in alarm. During confirmation period, the Control and Indicating Equipment (CIE) will enter alarm state when receiving an alarm from the same or from the other zone.

During alarm confirmation time, the Control and Indicating Equipment (CIE) will enter alarm state immediately in case there is another alarm even if the alarming zone is programmed for alarm verification.

During the alarm delay and alarm confirmation time, the Delay LED flashes.

14.2.2 Alarm Operations

During an alarm in one of the detection zones, the Control Panel performs the following:

- Switching ON the general alarm LED and the zone private alarm LED.
- Activating the horn output
- Activating the alarm dialer output
- Activating internal buzzer ON steadily
- Activating the alarm relay
- Activating the relevant Open Collector output (Zone 1 and/or Zone 2)
- Activating the Evacuation and Extinguishing outputs if an EM1 card is installed and extinguishing is configured for activation from this zone

14.2.3 Acknowledge / Buzzer-Off Operation

An Operator or Programmer password is required

- Silences the internal buzzer
- Stops the flashing in the general display area and zone display area. The LEDs stay constantly ON until the Control and Indicating Equipment (CIE) is reset

14.2.4 Silence / Resound Operation

An Operator or Programmer password is required

Pressing the **Silence** key performs the following actions

- Stops the action of the horn output

- Stops the action of the internal buzzer
- Switches ON the "Silence" LED
- Turns off Sounders LED

14.2.5 Resetting an Alarm

Resetting an alarm can be done by pressing the **Reset** key and entering the operator's password.

14.2.6 Action during a Second Alarm (Two Zone Coincidence)

When receiving a second alarm, (i.e., both zones in alarm concurrently), the Control and Indicating Equipment (CIE) perform the following operations

- Reactivation of all silenced output
- Activating the relevant Open Collector output
- For the TSA-200XT / TSA-240XT, entering the Pre Discharge Warning Time, or triggering the extinguisher output, if the Extinguishing Delay is programmed to zero.

14.3 Pre Discharge Warning Time (Extinguishing Delay)

In the TSA-200XT / TSA-240XT, (which contains an extinguishing module) If an alarm occurs in the second zone, the decision group is asserted, and If the extinguishing delay is programmed ON, the CP enters the Pre Discharge Warning Time.

By default, the Pre Discharge Warning time, (The Extinguishing Delay), is 0 seconds.

If the extinguishing delay is programmed to zero, the CP enters the Activated (Releasing) state (triggers the extinguisher) immediately, skipping the Pre Discharge Warning Time.

During the Pre-Discharge warning time (or Countdown), the Delay LED flashes, the Evacuation (Extinguishing) Strobe/Sounder is ON, and the Activated LED blinks

When the delay expires, the Delay LED is switched OFF

In the default configuration, if the Inhibit input (Hold/Abort) is asserted, the extinguishing process is inhibited.

14.4 Extinguishing Pulse Duration and the Activated Condition

When the Pre Discharge Warning time (extinguishing delay) elapses, if the Inhibit input is not asserted, or if the extinguishing delay is programmed to zero, the extinguisher is triggered and the extinguishing pulse duration period is entered,

The default extinguishing pulse duration is 20 seconds.

In the extinguishing pulse duration period, the Extinguisher output, the Evacuation Sounder/Strobe output, and the "Activated" LED are ON.

When the Extinguishing Pulse ends, the extinguisher output and the Activated LED are switched OFF.

The Evacuation Strobe/Sounder remains ON.

14.5 Post Extinguishing Pulse, No Reset

After the extinguishing pulse ends, The ECD enters the Extinguishing Fault condition.

In this state, the General fault Led, the Extinguishing Zone fault LED, the Fault relay and the Fault Dialer are all activated. This is done in order to alert the operator that the

extinguisher has been triggered, and it is now depleted (i.e. in a Fault condition), and needs attention and corrective action, i.e. replenishment or replacement. The buzzer remains in the Alarm mode (ON).

14.6 Reset Performed After Extinguishing Pulse Ends

If Reset is performed after the extinguishing pulse ends, then if alarm sources and other non extinguishing related faults are removed, ALL alarm and extinguishing indications, outputs and relays are OFF.

The Extinguishing Fault state remains:

The General Fault Led, the Extinguishing Zone fault LED the Fault Dialer and the Fault Relay are ON, and the buzzer changes to the Fault state (1/4).

14.7 Reestablishing the Quiescent condition after Extinguishing

After ALL the issues are resolved (Alarms removed and faults fixed) and the Extinguisher is replenished and brought to working order, and Reset was performed, the ECD remains in the Extinguishing Fault state, and needs be set to the Quiescent (Idle) state.

To do this, using the ECD keyboard, the programming mode has to be entered and exited, and then Reset has to be performed again.

If all issues are resolved, and there are no pending events, after entering and exiting the programming mode, the ECD returns to the quiescent state. (See Operating Instructions below).

14.8 Fault State

A fault in the system is indicated by flashing the yellow General Fault LED, and by flashing the specific LED of the faulty device/Input/output.

14.8.1 Actions Performed During Fault

When receiving a fault event at the Control and Indicating Equipment (CIE), the Control and Indicating Equipment (CIE) will perform the following operations

- Flashes the general fault LED
- Flashes the specific fault LED
- Activating the internal buzzer in the Control and Indicating Equipment (CIE)
- Activating the fault relay

14.8.2 Acknowledge / Buzzer-Off Operation

When an event causes LEDs to flash, pressing the "Acknowledge/Buzzer Off" key causes the Password LED to flash quickly. This informs the user that a password is required. Keying in the operator's password cause the following;

- Silencing the internal buzzer
- Switch ON the flashing LEDs.

14.9 Disablement State

Sometimes there is a need to disable some inputs or outputs of the system.

The Control and Indicating Equipment (CIE) will ignore alarms from disabled zones and will not activate disabled outputs or relays.

When one of the zones or output is disabled, the "Disabled" LED is turned on to indicate this status.

14.10 Test State

Test states allow testing the Control and Indicating Equipment (CIE) without activating outputs. This state is indicated by the **Test** and **Fault** LEDs.

See [Field Test](#), page 62, for additional information.

15 Operating Instructions

15.1 Default Operation

If the ECD is in the quiescent state, the Manual/Automatic operation is set to the Automatic & Manual mode, then triggers from detectors, MCP or the Manual Release inputs cause an Alarm state. If the extinguishing conditions are met, the CP starts the extinguishing process according to the programmed configuration and timing parameters. If the process is not interrupted by the Inhibit (Hold/Abort) input, the extinguishant is released.

15.2 Manual Only

It is sometimes necessary to prevent the extinguishing process from being automatically triggered by the detection zones. For example, this is required when welding is being performed in the detection zone.

In such a case, select the "Manual Only" mode of operation using the Keyboard switch.

In The Manual Only mode, ONLY Manual activation will cause the CP to enter the Activated state and proceed to extinguishing (i.e. alarms from detectors in zones will not cause the CP to enter the Pre discharge warning time and/or the Activated state).

This state is indicated by the "Manual Only" LED in the Extinguishing Zone display.

DO NOT FORGET TO SWITCH BACK TO THE "AUTOMATIC & MANUAL" STATE WHEN THE MANUAL ONLY MODE IS NO LONGER REQUIRED.

15.3 Manual Activation

Pressing the Manual Release push button switch causes the CP to enter the Activated condition, with all its indications and outputs activated. In the default case, the Manual Activation Delay is zero, and this will cause an immediate activation of the extinguisher and the ECD enters the extinguishing pulse period (and also the "Released" state). If the programmed delay is not zero, the ECD enters the Pre Discharge Warning Time at the end of which, if not halted by Hold/Abort, the extinguisher is triggered, and the CP starts the extinguishing pulse duration period.

Manual Triggering switches the Manual Trigger LED ON, while the zone alarm LEDs remain in their state prior to manual triggering

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Note

If the CP is in the Pre Discharge Warning Time caused by detection zones triggers, and then the Manual Trigger (PB) is activated, the extinguisher is released immediately, regardless of the programmed delay of zones, or the programmed delay of the Manual Trigger.

15.4 Alarm Delay

The TSA-200 product family can be programmed for Delayed or Non Delayed Alarm, as part of the Alarm Delay and Confirmation process. (Alarm Verification)

In the default configuration the alarm delay is OFF (Zero Delay), and it can be changed to 30 seconds using the keyboard.

See "[Dependency on more than one Alarm Signal](#)" (Alarm Verification Function, AVF) page 3.

See "[Control Panel Configuration and Programming](#)", page 57

15.5 Extinguishing Delay

The TSA-200 product family can be programmed for Delayed or Non Delayed extinguishing,

The extinguishing delay is also referred to as "Pre Discharge Warning Time".

In the default configuration, the CP is configured to 30 sec. extinguishing delay (from starting the warning time, caused by triggering both detectors zones, to the start of the Extinguishing Pulse), and no extinguishing delay for manual activation (PB) trigger.

15.6 Inhibit (Abort/Hold)

Sometimes, during the quiescent period or during the pre discharge warning time, inhibiting the extinguishing process is required. This can be accomplished by activating the Inhibit input, as long as the extinguisher has not been triggered.

The TSA-200XT and TSA-240XT support an Inhibit input and function, where the assertion of the inhibit (Abort/Hold) input is latched until reset, and inhibits the extinguishing process.

When the Abort/Hold input is asserted during extinguishing delay, the extinguishing process is terminated, the Hold/Abort LED flashes, the Delay and the Activated LED flash until the extinguishing delay elapses, when they are switched OFF, the Extinguishing Strobe/Sounder is switched OFF, and the Fault state is entered. The General Fault LED, Relay and Dialer flash, and the buzzer sounds the Fault signal (1/4).

The Extinguisher output is NOT ACTIVATED.

The Inhibit (Abort/Hold) input has no effect after Extinguishant release has started, but the Abort/Hold LED flashes when the Inhibit input is asserted.

15.7 Abort/Hold and Manual Activation

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Note

If the CP is in the Pre Discharge Warning Time caused by detection zones trigger, and then Hold/Abort is asserted, and then the Manual Trigger is asserted, then the extinguishant is released immediately, regardless of programmed delay of zones or of the Manual Trigger.

15.8 Pressure Switch

A pressure switch input is provided, as per "Monitoring the status of components – EN 54 7.10.4- Fault monitoring of fire protection equipment (Option with Requirements)

This is intended to indicate low pressure of the extinguishing media, in systems that have such a switch.

15.9 Reset

Pressing the Reset key resets the CP to the quiescent state if it is in the Fault (and the fault fixed), Alarm, Pre Discharge Warning Time and Activated states.

After the extinguishing pulse ends, pressing reset clears the Alarm and Activated states, but the Extinguishing Fault state remains

If all events and problems are cleared and resolved, reset reestablishes the quiescent (or idle) state, with one exception.

After the extinguishing pulse has elapsed, reset will change the state of the CP as described earlier, i.e. all alarm indications and outputs are OFF, BUT THE EXTINGUISHING AND GENERAL FAULT OUTPUTS AND INDICATIONS ARE ON, **and only after entering and exiting the programming mode**, and then pressing the reset key again (if all issues are resolved. i.e. no events) will the Quiescent state be reestablished.

15.10 Silencing and Resounding

The TSA-200XT / TSA-240XT has three sound sources: the Internal Buzzer, the Fire Alarm sounder (horn), and the evacuation (extinguishing) sounder. Their properties are explained below.

15.10.1 The Internal Buzzer

The Internal Buzzer sounds on every Alarm or Fault event. It can be silenced at any time, at access level 2, by pressing the Buzzer Off keyboard switch and keying in the password. The Buzzer resounds on any event, but it cannot be resounded through the keyboard.

15.10.2 The (Fire) Alarm Sounder

The Control Panel (ECD) has a FIRE ALARM Sounder output, typically a Horn.

This output operates on ANY alarm signal, even if the trigger source does not belong to the extinguishing decision group.

Silencing of the FIRE ALARM sounder (typically a Horn) output, is possible at access level 2, as it requires the Operator's password. Silencing is done by pressing the "Silence/Resound" keyboard switch.

The internal buzzer is also silenced when the alarm sounder is silenced

The Fire Alarm Silenced condition is indicated by a dedicated LED in the General Display area.

Resounding of the silenced Alarm sounder is possible by pressing the Silence/Resound key for several seconds.

15.10.3 Evacuation sounding Devices

The TSA-200XT /TSA-240XT has an output for an Extinguishing Sounder (Also referred to as the Evacuation Sounder, EVAC, or alarm device) output. It operates when the ECD enters the Pre Discharge Warning Time (extinguishing delay), during the extinguishing pulse and after the extinguishing pulse has ended, and remains ON until reset.

Silencing the alarm devices ONLY, is not supported!

However, the Extinguishing Module can be disabled by programming.

PLEASE NOTE THAT DISABLEMENT OF THE EXTINGUISHING MODULE DISABLES ALL THE EXTINGUISHING OUTPUTS AND MOST INPUTS. (See below)

15.11 Disablement

It is sometimes necessary to disable certain functions or interfaces of the ECD. (For example, if some welding is done near detectors, the ECD might be activated, and it is required to disable the affected zones, and rely on Manual Activation for protection against fire)

The control panel will ignore alarms from disabled zones and will not activate disabled outputs or relays.

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Note

Disabling the Extinguisher output also disables the inputs and the outputs of the extinguishing group members, except the Manual Release PB. When the Extinguishing group is disabled, pressing the Manual Release PB triggers an alarm, but not extinguishing.

15.12 Fault

The ECD monitors most of its inputs and outputs for faults.

When a fault is detected, the following occurs:

Fault relay and dialer are activated

Flashing fault LEDs: general fault LED, zone fault LED (if applicable), Ext, Zone LED (if applicable).

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Note

If a fault occurs in the extinguishing zone, the front panel extinguishing zone fault LED flashes, and the LED of the specific extinguishing zone I/O, located in the EM1 expansion module, next to the TB of the specific port, also flashes.

Also, the specific fault LED in the front panel general area middle or left column is ON.

The buzzer sounds the Fault signal (1-4 ON-OFF time ratio.)

Fix faults when they are discovered.

15.12.1 Fault Relay Output

A dedicated Fault relay is provided.

The dedicated fault relay has SPDT contacts.

The contacts used for fault indication are the Common (C) and the Normally Open (NO) contacts

During normal operation (no fault) the relay is powered and the Common and Normally Open contacts are closed. (The Common and Normally Closed contacts are open)

During fault, or when the ECD is not powered, the relay receives NO POWER, the Common and the Normally Open contacts are OFF. (The C and NC contacts are closed).

15.12.2 FWRE (Fault Dialer) Output

This output is used as a FWRE (Fault Warning Routing Equipment, or Fault Dialer) output as specified in EN 54-2.

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Note

During normal operation, the FWRE output is powered. When a fault occurs in the ECD, the power to the FWRE port is OFF, triggering the dialer.

16 Control Panel Configuration and Programming

The TSA-200 product family's operating parameters can be easily configured and modified in the field, by programming the required parameters, to allow for the specific requirements of each site.

System parameters modification is limited to access level 3, operator/programmer, through the front panel, or access level, using Telefire's proprietary and dedicated PC SW.

16.1 Programming by a PC

Some programming and modifications cannot be performed by the operator or technician, through the front panel, and are limited to PC programming at access level 4. These modifications of parameters are performed by connecting a PC with a proprietary and dedicated Telefire SW through a serial link, to the Control Panel.

The list of parameters that can be modified by a PC is shown below:

- Changing the Passwords
- Manual Release Delay ON or OFF. (When ON it has the same value as the Extinguishing Delay)

For the dedicated SW and the TSA-200 product family PC programming SW and instruction manual, please contact Telefire.

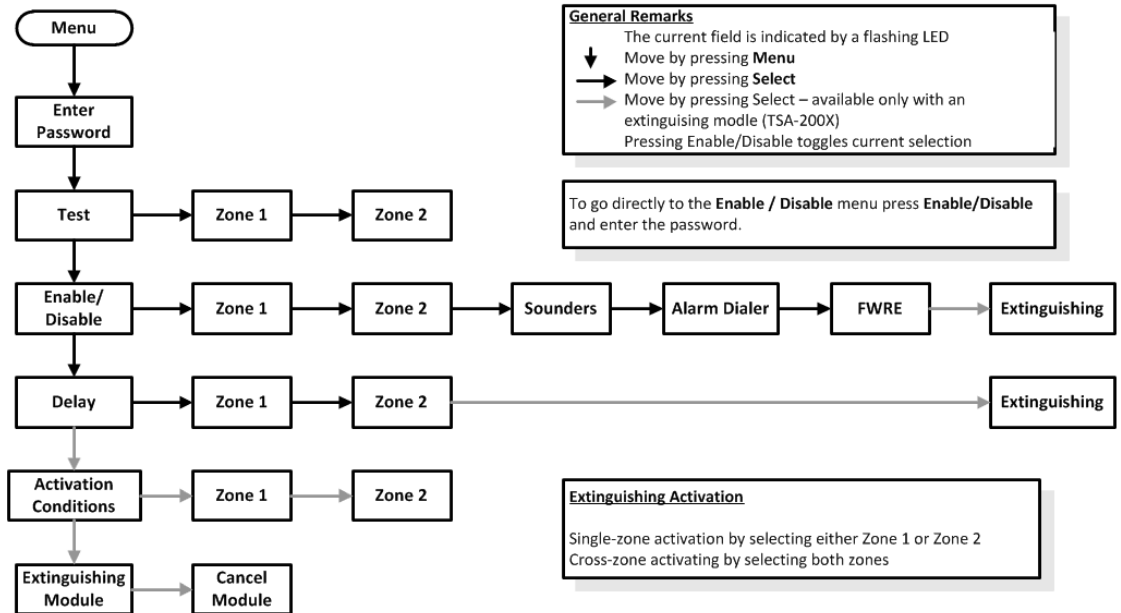
16.2 Programming and Settings by the Front Panel

Using the front panel, the operator/programmer can modify the general settings, zone configuration, and output activation conditions.

- Pre Discharge Warning Time (Extinguishing Delay) ON/OFF
- Selection of the extinguishing group members (elements contributing to the extinguishing decision), Zone 1, Zone 2 or both
- Disablement/Enablement of the extinguishing zone (Module).
- Disablement/Enablement of zones, Alarm sounder (Horn), Alarm/Released Dialer, FWRE.
- Alarm Verification (Delay) ON/OFF (Per Zone).
- Test (Per Zone).
- Lights Test (LEDs Test).

16.3 Menu Structure – Access Level 3

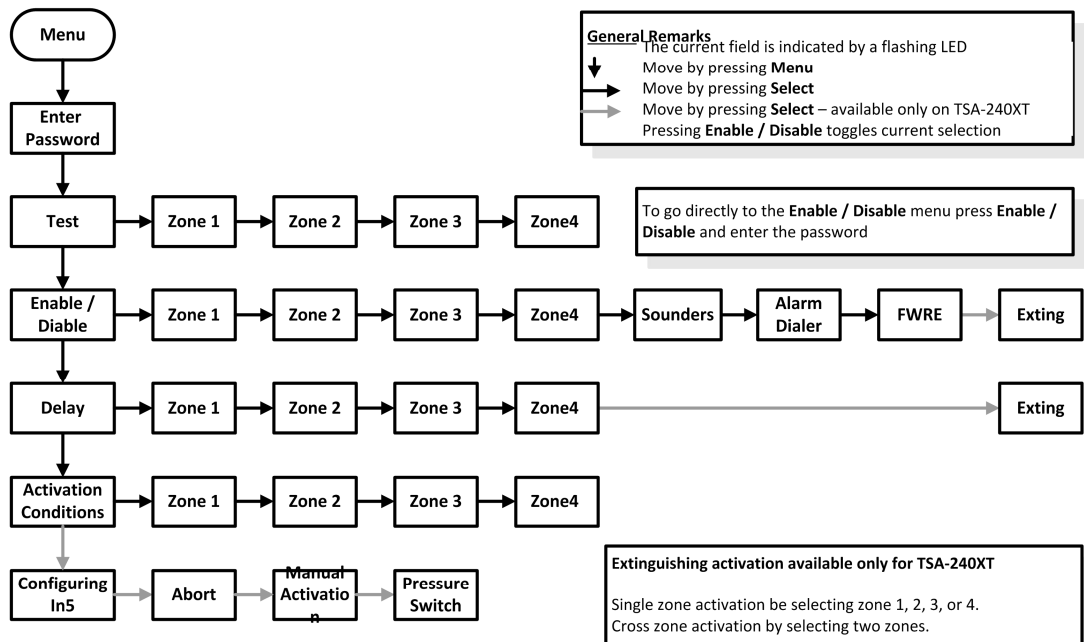
16.3.1 TSA-200 / TSA-200XT



11/2010

Figure 24 TSA-200 / TSA-200XT Programming Menu Structure – Access Level 3

16.3.2 TSA-240 / TSA-240XT



07/2014

Figure 25 TSA-240 / TSA-240XT Programming Menu Structure – Access Level 3

16.4 Entering the Programming Mode

Press **Menu** to enter the main menu. The **Password** LED will flash – enter the password (default – **2222** for level 3 access).

16.5 Exiting the Programming Mode

To exit the programming mode you can press Test/Save to save your programming and exit the menu, or press Reset, to exit the menu, and discarding the programming changes.

16.6 Keyboard Keys Functions during Programming

The keyboard has different functions in programming mode.

Key	Function in Programming Mode
Menu	Entering the Menu. Moves the "cursor" between programming menus (test; enable/disable; delay; activation conditions; removal of extinguishing module)
Select	Moves the "cursor" between fields (zone 1; zone 2; sounders; alarm/released dialer; FWRE; extinguishing)
Enable/Disable	Performs the following functions, depending on specific circumstances: <ul style="list-style-type: none"> • Starts or stops test mode for a zone • Enables or disables a zone, horn output; alarm dialer, FWRE; or extinguishing output • Sets or removes delay for a zone; horn output; alarm dialer; FWRE; or extinguishing output • Sets the extinguishing activation conditions (only zone 1; only zone 2; or both at the same time) • Disables the extinguishing module
Test/Save	In programming, saves changes and exits programming. When not in programming, switches all LEDs ON.
Reset	Exits the programming mode without saving programming changes.

16.7 Display during Programming

During programming a flashing LED indicates the programming field.

16.8 Programming Sequence

16.8.1 Programming Process

- Enter programming mode by pressing **Menu**
- Enter the password (default: **2222**)
- Press **Menu** to navigate between menus
- Press **Select** to navigate between fields
- Select the required option by pressing **Enable / Disable**
- Press **Save** to save the configuration in permanent memory

16.9 Alarm Delay (ON/OFF)

As part of supporting "Dependency on more than one Alarm Signal"(AVF, Alarm Verification Function)), the TSA-200 product family provides Alarm Delay and Confirmation. When this function is enabled, there is, by default, a 30 seconds Delay Period and 180 seconds Confirmation Period. When disabled, the Alarm delay is zero.

16.9.1 Enabling/Disabling the Alarm delay (AVF)

Press **Menu** to enter programming mode and enter the password (default **2222**).

Press **Menu** several times until the Delay LED is ON.

Press **Select** several times until the **Fault** LED for the selected zone flashes.

Press **Enable/Disable** to delay the extinguishing. Press **Enable/Disable** again to cancel the delay.

For an enabled zone, the zone's Fault LED is ON, with short OFF pulses.

For a disabled zone the zone's Fault LED is OFF, with short ON pulses.

Repeat for the second zone, if necessary.

The Fault LED of a Delay ENABLED zone is switched ON when another zone is selected or programming is exited.

The Fault LED of a Delay DISABLED zone is switched OFF when another zone is selected or programming is exited.

16.10 Programming the Extinguishing Module

The extinguishing module's inputs are pressure switch input (In 3); an input for manual extinguishing activation (In 4); and a Hold input (In 5). The Hold input will prevent extinguishant release as long as the switch is activated. Releasing the switch will start the Pre Discharge Warning Time (Extinguishing Delay) countdown.

16.10.1 Programming the Extinguishing Delay

Press **Menu** to enter programming mode and enter the password (default **2222**).

Press **Menu** several times until Delay LED is ON.

Press **Select** several times until the **Fault** LED of the extinguishing zone flashes.

Press **Enable/Disable** to delay the extinguishing. Press **Enable/Disable** again to cancel the delay.

The Fault LED of DELAYED extinguishing zone is switched ON when another zone is selected. (By pressing Select)

The Fault LED of NON DELAYED extinguishing zone is switched OFF when another zone is selected. (By pressing Select)

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Note

Pre Discharge Warning Time, as programmed by a PC, is valid only if Extinguishing Delay is enabled through the front panel

16.10.2 Programming the Extinguishing Activation Conditions

Press **Menu** to enter programming mode and enter the password (default **2222**).

Press **Menu** three times to go to the activation condition menu.

Press **Select** until the **Alarm** LED in the Zone 1 display area will flash.

Press **Enable/Disable** to remove Zone 1 from the activation conditions. Press **Enable/Disable** again to include Zone 1 in the activation conditions.

Press **Select** until the **Alarm** LED in the Zone 2 display area will flash.

Press **Enable/Disable** to remove Zone 2 from the activation conditions. Press **Enable/Disable** again to include Zone 2 in the activation conditions.

If both zones are included in the extinguishing activation, extinguishing will be activated only when both zones are in alarm at the same time. If only a single zone is included in the extinguishing activation, extinguishing will be activated only by that zone.

16.10.3 Disabling/Enabling the Extinguishing Module

To disable the extinguishing module enter programming mode by pressing **Menu** and key-in the password (default: **2222**). Press **Menu** repeatedly to get to the disablement menu. Press **Select** repeatedly to access the Extinguishing Module. Press **Enable/Disable** to disable/enable the extinguishing module.

16.11 Saving Data and Exiting the Programming Mode

Press **Save** to save the configuration in permanent memory

The system stores configuration programming permanently, even when both primary and secondary power sources are disconnected.

16.12 Recording Programmed Timing Values

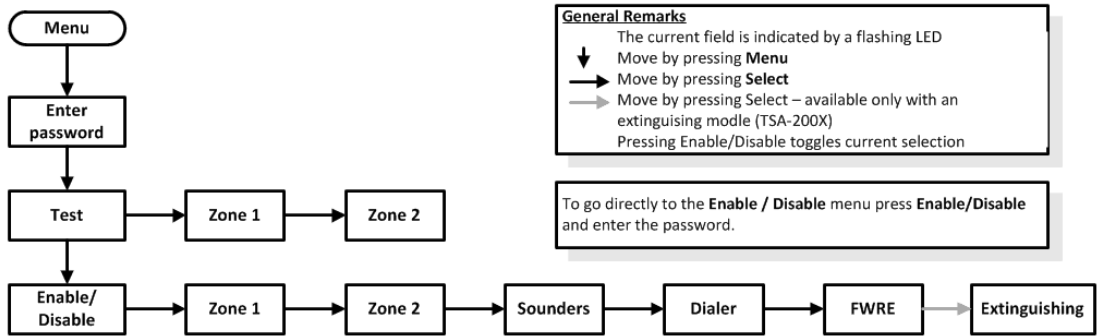
After setting the timing values, (default or programmed), **write down the Extinguishing Delay Time and the Extinguishing Pulse Duration values by a non water soluble (but Alcohol soluble) marker in the allocated spaces in the label attached to the inside of the TSA-200 product family door.**

Erase and write down updated values when they are programmed and or modified.

17 Support Functions Programming

17.1 Menu Structure – Access Level 2

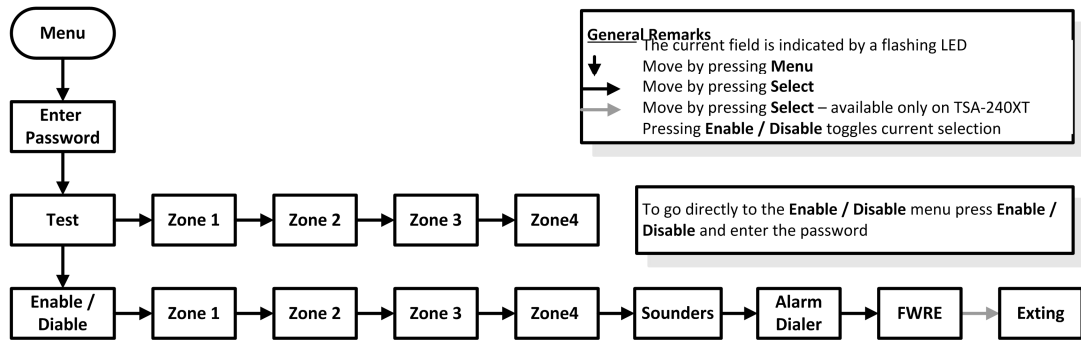
17.1.1 TSA-200 / TSA-200XT



11/2010

Figure 26 TSA-200 / TSA-200XT Programming Menu Structure – Access Level 2

17.1.2 TSA-240 / TSA-240XT



07/2014

Figure 27 TSA-240 / TSA-240XT Programming Menu Structure – Access Level 2

17.2 Enabling or Disabling an Input or Output

Press **Menu** to enter programming mode and enter the password (default 1111).
 Press **Menu** twice to go to the Enable/Disable menu.
 Press **Select** until the **Fault** LED for the appropriate zone or output will flash.
 Press **Enable/Disable** to disable or enable the zone or output.

17.3 Field Test

Press **Menu** to enter programming mode and enter the password (default 1111).
 Press **Menu** to go to the Test menu.
 Press **Select** until the **Fault** LED for the appropriate zone will flash.
 Press **Enable/Disable** to disable or put the zone in test mode.
 Repeat the process to exit the zones from test mode and return to normal operation

17.4 Changing the Password

The password can be changed via a PC program.

17.5 Lamp Test

Lamp test will activate all LEDs in the control panel and the internal buzzer for two seconds for testing purposes.

Press **Test** to perform lamp test.

18 Commissioning

- Verify that ALL POWER SOURCES are disconnected.
- Verify that THE EXTINGUISHER IS DISCONNECTED (disconnect both wires to the extinguisher), connect a DUMMY load to the extinguisher output.
- Verify that all required interfaces are connected. Verify correct wiring.
- Verify presence and connection of required (ONLY) and correct EOL resistors.
- Connect mains and battery.
- Fix all faults
- When ALL faults are fixed and the ECD is in the quiescent state, configure and program the ECD as required.
- Update site specific data and date and time
- Change the level 2 and 3 passwords (Recommended).
- Verify that the POWER LED is ON with short OFF pulses
- Perform a full Field Test,
- Perform an activation test.
- Test and verify correct operation from detectors and from manual activation
- Verify that the ECD lock and switch keys are available and accessible to operators
- Attach the required documentation to or near the Control Panel
- Disconnect ALL power, Remove the dummy load, and connect the extinguisher to the extinguishing output or output lines.
- Connect mains and batteries.
- Fix all problems
- Verify that the ECD is in the quiescent state.

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Note

Do not access, probe, or touch the area near the AC input terminals when the CP is powered, to avoid electric shock.

18.1.1 Additional System Documentation

In different countries and according to some CP installation regulations, it is sometimes required to place a document containing condensed system information and operating instructions, on or near the CP.

Attach the condensed instructions document to the system's front panel, or frame it and place it in a prominent, highly visible position nearby.

It is recommended that the document shall at least contain the following;

- Actions to be taken upon events of alarm or fault by the operators
- A list of areas/zones as installed in the protected premises, and blank spaces for their details and description
- Text referring to The name, address and phone number of the service representative, and blank spaces to fill in the details after installation
- Text referring to the name, address and phone number of the Installing representative, and blank spaces to fill in the details after installation.
- Document issue number and date

- If the document is not attached to the CP front panel, a note at the bottom stating that it shall be framed and placed near the CP for ready reference.

A sample form is attached at the end of this manual.

19 Maintenance

No specific maintenance is required for the TSA-200 product family.

Keep the TSA-200 product family clean and dry. If necessary, clean the outside of the enclosure with a slightly damp cloth.

The batteries should be tested and replaced according to the instructions of the battery's manufacturer.

If the batteries show any signs of swelling, leakage or corrosion, or the ECD indicates a battery fault, replace with a new set.

Maintenance routine:

Tighten the TBs

Verify ECD is in the quiescent condition

20 Routine Testing

The CP shall be tested weekly as specified in the next paragraph.

The system should be fully tested at least twice a year, or as required by national and/or local fire codes. All devices, system wiring and component functions should be tested and maintained. These inspections should be performed in addition to the routine maintenance activities such as cleaning the detectors (which should be performed in accordance with Telefire's instructions).

Perform a Field Test of each zone.

Maintenance and test actions shall be conducted by a company or service technician authorized by Telefire.

Records of all inspection and maintenance activities should be kept.

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Note

Testing shall be performed by authorized service personnel that are employed by authorized companies.

20.1 Weekly Inspection – To Be Performed By Site Personnel

The site's delegated worker should inspect the control panel weekly and verify that the ECD is in the quiescent state, as detailed below:

- The green Power LED is ON with short OFF pulses.
- None of the yellow or red LEDs are on or blinking
- The control panel's fault buzzer does not sound
- Perform a Light Test to verify that all LEDs are functioning.

Call your service company if any of these conditions is not met

21 Troubleshooting

21.1 Faults

When in the quiescent (Idle) state, the Power (Green) LED is ON with periodic short OFF pulses.

When a fault occurs, it results in (at least) the following:

General Fault LED Flashes, Fault Relay activated, FWRE activated, buzzer sounds 1 second ON, 4 seconds OFF (Fault Signal).

If the fault occurs in any of the extinguishing related inputs or output, the extinguishing zone fault LED also flashes. In addition, a fault LED of the specific port flashes also.

To assist in troubleshooting, the TSA-200XT / TSA-240XT has 5 fault LEDs on the EM1 Extinguishing expansion module, adjacent to the inputs and outputs terminal blocks.

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Note

These support LEDs are only visible with the door open!

The LEDs are assigned to (from left to right): Extinguisher, Extinguishing Sounder, Pressure Switch, Manual Release, and Hold.

Troubleshooting and fault analysis can be performed by observing the display, analyzing the source of the fault by monitoring the Front Panel LEDs that flash, observing the EM1 LEDs that flash, and then dealing with the cause of the fault.

After repair, the proper operation can be verified, i.e. the CP is OK when no fault is indicated.

21.2 Maintenance Alert

Photoelectric and multi-sensor smoke detectors manufactured by Telefire have unique physical characteristics that allow them to operate for very long period under normal operating conditions.

The detectors perform drift compensation automatically as dust residue collects in the detector until such time that the detector can no longer compensate for the drift. At this point the detector will indicate the need to clean it by increasing the detector indicating LED flashing frequency from once every four and a half seconds to twice a second.

The CP will indicate a fault, and the zone with detector/maintenance fault by flashing the zone fault LED,

22 Standards compliance and approvals

Telefire’s TSA-200 product family have the following certification and approvals:

- EN 54-2 and EN 54-4 certified
- CE Marked
- UL 864 edition 9 compatible
- GOST 53325-2009 certified

22.1 CE Label

The TSA-200/200XT is CE marked.

The CE label is shown below.

It is attached to the outside of the box (per EN-54-2) on the left side

Do not remove the label.

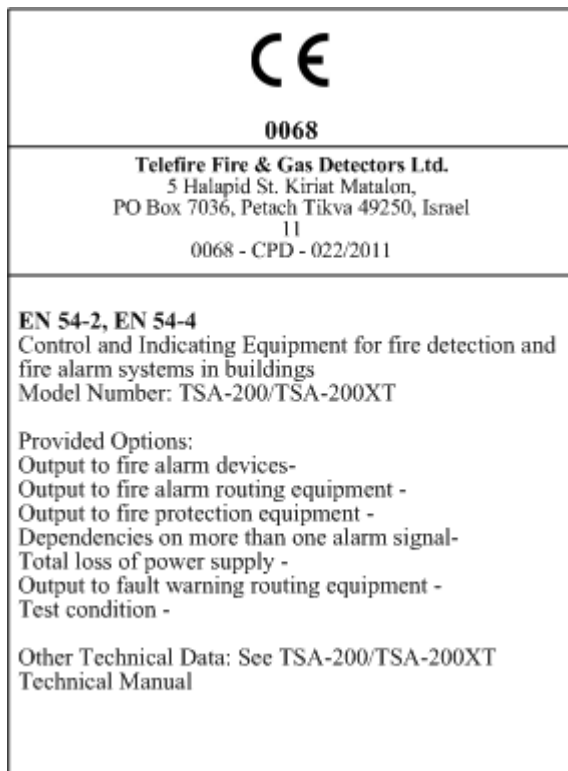


Figure 28 TSA-200 product family CE label



TSA-200 Instructions for Immediate Action

Normal		"Power" LED is on with short OFF pulses.
<i>Alarm</i>	Condition	"Alarm" LEDs, internal buzzer and the Alarm Sounder are ON.
	Action	Take appropriate actions in accordance with the pertinent instructions at your site, and notify the relevant entities.
	Silencing	To silence the alarm sounder press the " Silence " key.
Return to Normal Operation from Alarm		After taking the actions detailed above, restore the system to normal operation by pressing the " Reset " key.
Automatic Extinguishing		Extinguishing is performed automatically, without human intervention (Except for triggering by Manual Trigger). After extinguishing pulse ends, the TSA-200 enters the "Extinguishing Fault" state. Call the service representative listed below if the extinguishers were activated, to replenish the extinguishant, restore extinguishing capability and return to normal operation.
Fault	Condition	The General and specific " Fault " LEDs turns on, and the internal buzzer sounds.
	Action	Take appropriate actions in accordance with the pertinent instructions at your site. Resolving the fault will automatically restore the system to normal operating conditions.
	Silencing	To silence the internal buzzer press the " Buzzer Off " key.

Please refer to the TSA-200 Technical Manual for further information.

Zone	Description
1	
2	

Details of service representative, to be called in the event of fault;

Name: _____

Address: _____

Phone: _____

Details of installing organization

Name: _____

Address: _____

Phone: _____

This document shall be framed and placed adjacent to the control unit