



# TPH-442A

## Analog Addressable Multi-sensor Photoelectric / Heat Detector

### Technical Manual

**TELEFIRE**  
PO Box 7036  
Petach Tikva 49250  
Israel  
Tel: 972 3 921 1955  
Fax: 972 3 921 1816  
email: [marketing@telefire.co.il](mailto:marketing@telefire.co.il)  
Web: [www.telefire.co.il](http://www.telefire.co.il)

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## 1. Introduction

Telefire's TPH-442A Analog Addressable Multi-sensor Photoelectric / Heat Detector is a microprocessor-controlled multisensor detector that combines photoelectric and heat sensors for enhanced fire detection capabilities.

The detector consists of a photoelectric sensing mechanism that contains a vented chamber (labyrinth), an infrared transmitter and a receiver that detects light scattered from the smoke particles in the chamber, and a thermal sensor that measures the ambient temperature. The detector uses a smart algorithm to analyze the physical parameters (smoke and heat), evaluate their values and trends, and dynamically modify its sensitivity. The detector transmits one of nine predetermined values to the control panel for final analysis and decision. This process reduces occurrences of false alarms without reducing sensitivity to real fire.

The address of the TPH-442A is programmed into the memory of the detector and can be assigned or changed by using the PROG-4000 programmer.

The TPH-442A offers the following advantages:

- The TPH-442A's powerful microprocessor performs signal processing and enables precise control of the photoelectric chamber and heat sensor. The microprocessor offers a high level of noise immunity. The microprocessor also performs signal processing, enables accurate control of the photoelectric chamber according to pre-set parameters, and manages the communication process with the control panel.
- The TPH-442A detector excels in sensing smoldering smoke and differentiating between fires and false alarms due to other events that produce heat or smoke, such as cooking.
- Soft-set address – the detector's address is programmed into its memory without the use of mechanical switches or moving parts.
- Can be tested directly with a test magnet or remotely from the control panel.
- The detectors chamber and labyrinth can be cleaned in the field by authorized people.
- It is considered "green" (environment friendly) as it does not contain radioactive materials.

## 2. Installation

The TPH-442A is particularly suited for areas where it is not possible to use a single parameter to determine the presence of fire due to high interference. Analyzing the values and trends of two different parameters provides a highly reliable alarm signal.

Observe NFPA 72 guidelines and local fire codes when installing the TPH-442A.

When installing a TPH-442A smoke detector on a slanted (up to 45°) ceiling that allows free flow of smoke (i.e., there are no beams or other obstacles) the detector should be installed parallel to the flow line of the ceiling, and not horizontally. For ceilings with impediments to free smoke flow please refer to the relevant local fire code standard.

Use only Telefire's TFB-110A Analog Addressable Detector Base.

For remote signaling use only Telefire's TFL-1NA Auxiliary Signaling Indicator for Analog Addressable Detectors.

The TPH-442A is an analog addressable detector that is intended for use with Telefire's ADR-3000 fire alarm control panels.

## 2.1. Wiring

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The detector is connected to the control panel via the TFB-110A detector base and a twisted pair, two-wire cable (SLC line from the control panel). Please refer to the TFB-110A technical manual for additional details on SLC wiring.

The detector can activate TFL-1NA auxiliary signaling lamps through a dedicated Lamp output on the base. Please refer to the TFL-1NA and TFB-110A technical manuals for additional details regarding the connection of TFL-1NA auxiliary signaling lamps.

All wiring must conform to applicable local codes, ordinances and regulations.

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### Note

Notify the operator or the security personnel that the system will be temporary disconnected before adding a smoke detector to an existing SLC loop.

## 2.2. Address Programming

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Assign the TPH-442A's address in the range of 1 – 127 prior to installation by using the PROG-4000 Analog Addressable Detector and Accessory Programmer. Please refer to the PROG-4000 manual for additional details.

## 2.3. ADR-3000 Configuration

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Configure the detector as **"PHOTO&HEAT"A DETECTOR"** in the ADR-3000. Configure the detector's sensitivity at the control panel ("**2**" – most sensitive, "**10**" – least sensitive". Please refer to the ADR-3000 technical manual for a detailed description of programming and configuration.

# 3. Maintenance

The ADR-3000 control panel monitors the analog detectors continuously. Any abnormal condition in the detector will cause a trouble signal to be displayed on the control panel. When a detector becomes contaminated to a degree that cannot be compensated, the control panel will display a maintenance trouble signal. At this point the detector must be cleaned.

## 3.1. Periodic Testing

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Fire alarm systems should be checked periodically. Please refer to NFPA and local fire codes to determine service frequency.

Use the control panel's Walk Test mode to perform automatic reset. Please refer to the control panel's manual for additional details on how to perform Walk Test.

### 3.1.1. Test Procedure – Locally

1. Apply a magnet to the side of the detector next to the LED for 3 – 5 seconds. This activates an internal testing circuit that simulates presence of smoke in the detector, tests the sensing mechanism and the detector's electronic circuit.

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### Warning

**Do not apply naked flame to the detector!**

2. The analog value representing one of nine predetermined values of smoke and heat levels will be transmitted to the control panel for evaluation. The control panel will transmit a signal to the detector to turn on its LED. During the test the detector's values may be observed at the control panel. Please refer to the ADR-3000 manual for additional information.

3. Once the detector is in alarm mode, it keeps the alarm condition until reset by the control panel. If the control panel is in "Walk Test" mode, it will reset the alarm after a few seconds. Please refer to the ADR-3000 manual for instructions on how to conduct a walk test.

**3.1.2. Test Procedure – From the Control Panel**

It is also possible to test the detector using the ADR-3000's "Monitor" option menu. Please refer to the ADR-3000 manual for instructions on how to use and interpret the monitor screen.

**3.2. Cleaning**

Contamination is a by-product of normal operation and may be caused by various sources, most of which are impossible to eliminate. Normal human activity creates a constant source of airborne dust and dirt that over a period of time may affect the detector's performance.

Analog detectors should be cleaned when a maintenance signal appears on the control panel. Local regulations may specify an interval period for maintenance schedule.

The TPH-442A's chamber is removable and can be cleaned or replaced. Cleaning should be done by qualified personnel in order to ensure that the detector is properly handled, reassembled correctly and tested for proper operation.

**4. Specification**

Diameter (including base).....	124 mm
Height (including base and LED).....	64 mm
Weight .....	107 gr.
Operating Temperature Range.....	-10°C – +60°C (14°F – 140°F)
Relative Humidity Range .....	10% – 93% non-condensing
Sensitivity Range (set at control panel) .....	preset combination of rate of temperature rise and amount of smoke, set in 9 steps.
Most sensitive (sensitivity level 2).....	0.8% / 8°C/minute / 62°C.
Least sensitive (sensitivity level 10).....	2.4% / 12°C/minute / 76°C.
Factory Default (sensitivity level 5) .....	1.4% / 9.5°C/minute / 68°C.
Operating Voltage (supplied by control panel) .....	20 V modulated
Maximum Current Consumption:	
Quiescence mode.....	290 µA
Alarm mode (without Auxiliary Indicators) ....	2.6 mA
Alarm mode (3 Auxiliary Indicators).....	35 mA
Maximum Current to auxiliary indicators .....	50 mA

**LOCAL INDICATION** Local red LED (light-emitting diode) and an auxiliary indicator output. Use only Telefire's TFL-1NA Auxiliary Indicator for Analog Detectors. Connect up to 5 auxiliary indicators to each detector.

**All values are nominal. Specifications are subject to change without prior notice.**

## 5. Certification

Telefire's TPH-442A Analog Addressable Conventional Multi-sensor Photoelectric / Heat Detector has the following approvals:

- EN-54 Approved
- SI 1220 Approved
- UL 268 and 521 Compliant
- CE Marked