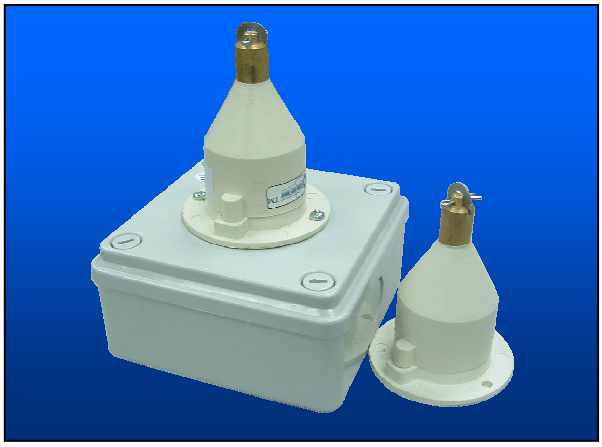
PYROGEN

THERMAL ACTIVATION DEVICE

(TAD)



Description

TAD is a unique thermal detection and activation device that allows to detect a fire and the pyrogen fire suppression generator units.

Features:

- **TAD** can also be used as a standard thermal detector with a fixed temperature reading
- can be connected to a standard fire-indicating panel using an additional electronic box.
- Complied with an explosion proof junction box **TAD** can be used in a safety sensor D3 for application in hazardous areas.
- The device **TAD** is designed for autonomous actuation of a fire suppression system.

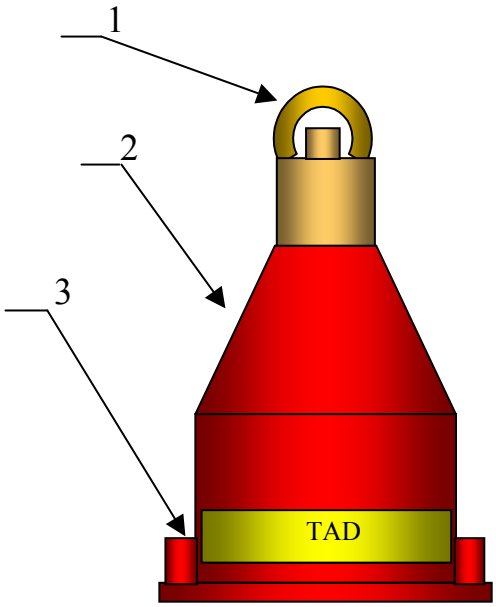


Figure 1. Schematic of TAD

- No external power supply is required

A schematic of **TAD** is shown in Figure 1.

1. Heat sensitive lock made from alloy
2. Housing made from high-temperature plastic
3. Base

Operation:

When a heat-sensitive element (1) reaches its rated temperature a spring-loaded rod mounted inside a nosepiece is being released. The spring moves a cylindrical shape magnet, mounted on the rod, through an induction coil. The induction coil generates an electric impulse. The impulse is transmitted to the electrical terminals and further to the aerosol or powder fire extinguishers. **TAD-P** modification of the device is used for manual actuation of a fire suppression system. A schematic of **TAD-P** is shown in Figure 2. Its operation is as follows. In case of a fire a split pin is removed from the device by manually pulling a ring . This action releases a spring-loaded pin. Further sequence of events is similar to that for **TAD.**

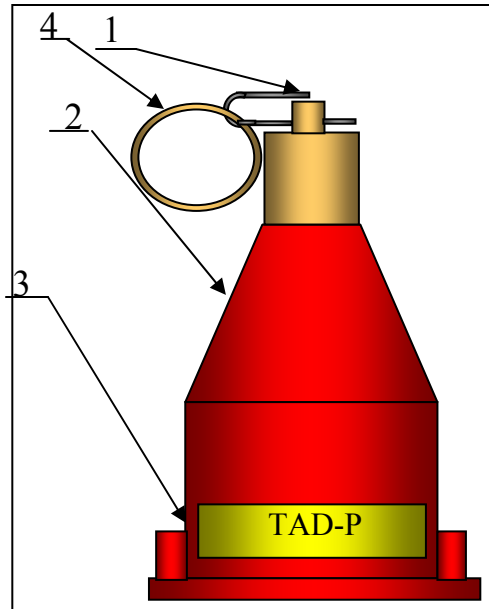


Figure 2. Schematic of TAD -P

1. Split pin
2. Housing made from high-temperature plastic
3. Base
4. Pull ring

Product Range

The device **TAD** comes in five different models. Four models operate automatically, similar to the thermal detectors with rated temperatures. The fifth model is designed for manual actuation of the fire extinguishers.

The following models are available:

1. Model TAD-45 (suitable for cold areas)
2. Model TAD-72 (standard application)
3. Model TAD-93 (custom made for specific applications)
4. Model TAD-110 (suitable for motor rooms and tracks)
5. Model TAD-P (designed for manual activation)

Techical Characteristics

- Dimensions and Mass

1. Length, mm – not more than 85mm;
2. Diameter, mm – not more than 65mm;
3. Total mass, kg – not more than 0.2

- Operation Temperature

1. TAD-45 from –60 to +30ºC;
2. TAD-72 from –60 to +55ºC;
3. TAD-93 from –60 to +80ºC;
4. TAD-110 from –60 to +95ºC;
5. TAD-P from –60 to +95ºC

- Rated Activation temperature

1. TAD-45 +45ºC±5ºC
2. TAD-72 +72ºC±5ºC
3. TAD-93 +93ºC±5ºC
4. TAD-110 +110ºC±5ºC

Activation Time

- Activation Time

Activation time depends on the model of **TAD,** initial ambient temperature and temperature increases rate.

The temperature increase rates (TIR) of **3ºC/min** and **30ºC/min** have been selected as standard. For TIR 30ºC/min activation time should be in the range of 58 – 144 seconds and for TIR 3ºC/min - in the range of 580 –960 seconds.

Test results on the **TAD** activation times are showed

		TIR 30ºC/min		TIR 3ºC/min	
TAD Model	Initial Ambient Air Temp. (ºC)	Maximum Time Delay, s	Minimum Time delay, s	Maximum Time Delay, s	Minimum Time Delay s
TAD-72	35	93	85	740	724
TAD-93	55	125	111	857	725
TAD-110	70	137	125	950	937

Table 1. Activation times for **TAD**

Electrical Parameters

An electrical diagram of the device is showed in Figure 3.

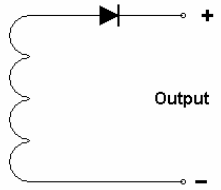


Figure 3. Electrical diagram for **TAD**

The device generates an electric impulse with amplitude of 3.5V DC at the circuit resistance of 1.0 Ohm. The duration of the electric impulse is not less than 1 millisecond for the amplitude of not less than 3.0V DC. The device can activate the following types of electrical initiators: MB-2H, 3A-1, PP-9, YGP-10, and similar.

Applications & Limitations

1. Volume protected by one device shall not exceed 18m³**.**

2. The dimensions of a protected area shall not exceed:

Height - 3.0 meters
Width - 2.4 meters
Length - 2.5 meters

3. The device should be located in the middle of the protected area at 100-150 mm below the ceiling.

4. The device is capable of sustaining vibration from 0.5 to 200 Hertz with acceleration of 4g.

5. The device is capable of sustaining impacts of up to 4g-force of 2 to 50 milliseconds duration.

6. The device is suitable for application in hazardous areas of 2ExeIIT6 category.

7. If used in conjunction with the D3 safety sensor the device can be used in hazardous areas of POExiaI category.

8. Maximum relative humidity – 98% (no condensation).