**THERMAL ACTIVATION DEVICE (TAD)**

**Description:**
The TAD is a unique electro-mechanical device which detects heat from a fire then automatically converts mechanical movement into electrical current which in turn activates the Pyrogen fire suppression generators.

**Features:**
- **Stand-alone** thermal detector with a fixed temperature rating.
- With optional Relay Base Box, the TAD is equipped with 2 sets of relay outputs (2 x NO/ 2 x NC)
- When used together with an explosion proof junction box, the TAD is rated for D3 Safety Sensor for hazardous areas.
- Designed for autonomous actuation of a fire suppression system.
- **No external power** is required.

**Operation:**
When heat-sensitive element (1) reaches its rated temperature a spring-loaded rod mounted inside the nosepiece is released. The spring moves a cylindrical shaped magnet, mounted at the other end of the rod, through an induction coil. The induction coil generates an electric impulse. The impulse is transmitted to the electrical terminals connecting to Pyrogen to activate the aerosol generator.

The TAD-P is a modification of the device for manual actuation of a fire suppression system. A schematic of TAD-P is shown in Fig 2. Its operation is as follows. In case of a fire a split pin is removed from the device by manually pulling a ring attached to the split pin. This action releases the spring-loaded rod and magnet assembly. Further sequence of events is similar to that for TAD.

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**Fig. 1: TAD External Components**
1) ‘C’ clip – heat sensitive metal alloy
2) Body – fibre reinforced thermo-plastic
3) Base – fibre reinforced thermo-plastic

**Fig. 2: TAD - P**
1) Split-Pin & Ring for manual activation
2) Body
3) Base
**Product Range:**
The 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)

**Technical Characteristics:**

*Dimensions and Mass*
85mm (L) x 65mm (Dia); <0.2kg

*Operation Temperature*
1. TAD-45 from −60 to +30°C;
2. TAD-72 from −60 to +55°C;
3. TAD-93 from −60 to +80°C;
4. TAD-110 from −60 to +95°C;
5. TAD-P from −60 to +95°C

*Rated Activation temperature*
1. TAD-45 +45°C±5°C
2. TAD-72 +72°C±5°C
3. TAD-93 +93°C±5°C
4. TAD-110 +110°C±5°C

*Activation Time*
This is dependent on the individual rating of each model, initial ambient temperature and temperature increase rate.

<table>
<thead>
<tr>
<th>TAD Model</th>
<th>Initial Ambient Air Temp. (°C)</th>
<th>TIR 30°C/min</th>
<th>TIR 3°C/min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Max. time delay, s</td>
<td>Min. time delay, s</td>
</tr>
<tr>
<td>TAD-72</td>
<td>35</td>
<td>93</td>
<td>85</td>
</tr>
<tr>
<td>TAD-93</td>
<td>55</td>
<td>125</td>
<td>111</td>
</tr>
<tr>
<td>TAD-110</td>
<td>70</td>
<td>137</td>
<td>125</td>
</tr>
</tbody>
</table>

*Table 1: TAD Activation Times*

**Electrical Parameters:**
An electrical diagram of the device is showed in Fig. 3.

- 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 with the approx. dimensions of 3.0 m (H) x 2.4m (W) x 2.5m (L)
2. The device should be located in the middle of the protected area at 100-150 mm below the ceiling.
3. The device is capable of sustaining vibration from 0.5 to 200 Hertz with acceleration of 4g.
4. The device is capable of sustaining impacts of up to 4g-force of 2 to 50 milliseconds duration.
5. The device is suitable for application in hazardous areas of 2ExellT6 category.
6. If used in conjunction with the D3 safety sensor the device can be used in hazardous areas of POExial category.
7. Max Relative Humidity – 98% (no condensation).