



1. PURPOSE: This ARP is intended to cover the detail installation requirements and the temperature response characteristics of various types of temperature responsive elements intended for well type installation in air-cooled aircraft engine cylinder heads. Provision of the well for installation of the parts shall be made by the engine manufacturer in such a location as to give characteristic temperature response for indication and control of engine cylinder temperature. The details of this ARP may also be applied to temperature measuring applications other than air-cooled aircraft engine cylinder heads.

2. GENERAL REQUIREMENTS:

2.1 Operating Limits: Thermo-sensitive element assemblies shall be suitable for continuous operation under any engine power and service conditions without deterioration, due to vibration or corrosion, and shall not be subject to deviation from the calibration requirements of 4.1 and 4.2.

2.2 Response Limits: Thermo-sensitive element assemblies shall be of such design and construction as to meet the response limitations for immersion error due to the element being used in a well subject to a high thermal gradient along its length.

3. DETAIL REQUIREMENTS:

Figure 1 shows the machining dimensions of the well to be provided by the manufacturer in the cylinder head of the engine, together with an outline of the installed adapter and clearance required for removal of the thermo-sensitive element. In addition, Figure 1 refers to AS 236 for the Adapter, Thermo-sensitive Element, which may be supplied installed in the cylinder by the engine manufacturer or supplied by the instrument manufacturer, depending on contractual arrangements. Figure 1 also refers to AS 196 and AS 234 that give the envelope dimensions and other detail requirements of the Thermo-sensitive Element which apply to all types of thermocouples, and to resistance or other temperature sensitive bulbs respectively.

Clearance for the installation and removal of the thermo-sensitive element shall be provided to eliminate the necessity of removing other than readily removable engine parts. Specific types of elements shall be covered by detailed procurement specifications and in each case appropriate identifying marks and designations shall be stamped, or otherwise permanently marked, on the outer face of the knurled collar or appropriate metal identification tag.

4. INSPECTION AND TEST REQUIREMENTS:

4.1 Thermo-electric Potential: The thermo-electric potential of thermocouples shall conform to the standard specified by the purchaser within + 5 F in the temperature range 300 to 500 F. This shall be determined by full immersion of the bulb end of the thermo-sensitive element in hot oil or other suitable fluid under laboratory controlled conditions.

4.2 Resistance: The resistance of standard resistance type elements shall conform to the requirement of the purchaser within + 5 F in the temperature range from 300 to 500 F. This shall be checked by full immersion of the bulb end of the thermo-sensitive element in hot oil or other suitable fluid under laboratory controlled conditions.