

**NOTE: THE FOLLOWING PARAGRAPH NUMBERS REFER TO API-670, THIRD EDITION, NOVEMBER 1993
WHICH IS PART OF THIS PRACTICE**

SECTION 1 - GENERAL

- I 1.1 SCOPE
- a. This practice covers the design and installation of vibration, axial position and bearing temperature monitoring systems for shaft and casing vibration and bearing temperature measurements of the following types of machinery:
1. Special Purpose, and Utility and Instrument Air Centrifugal Compressors.
 2. Axial Compressors.
 3. Rotary Screw Compressors.
 4. Special Purpose Steam Turbines.
 5. Combustion Gas Turbines and Expanders.
 6. High Speed, Special Purpose Gear Units.
 7. A-C Motors of **Sub Items 1, 2, and 3** above, and Synchronous Generators.
- b. **An asterisk (*)** indicates that a decision by the Purchaser is required or that additional information is furnished by the Purchaser.
- c. All specifications in this practice are additions to those of **API-670** unless specifically noted as exceptions. Paragraph numbers in this practice which do not appear in **API-670** are new paragraphs.
- 1.5 REFERENCED PUBLICATIONS
- I 1.5.4 **Table 1** lists the practice and standard which shall be used with this practice.

TABLE 1

PRACTICE	
IP 15-7-2	Protective Systems
STANDARD	
API Standard	
670	Vibration, Axial Position, and Bearing Temperature Monitoring Systems

SECTION 2 - GENERAL DESIGN SPECIFICATIONS

- I 2.4 SCOPE OF SUPPLY AND RESPONSIBILITY
- a. The Vendor that has train responsibility shall be responsible for the purchase of monitoring systems, system design, and installation of sensors and signal conditioners including wiring between sensors and signal conditioners, within the confines of the baseplate, for the entire train.
- * b. Unless otherwise specified, **vibration sensors, signal conditioners and monitors** shall be procured from the same manufacturer.

SECTION 3 - CONVENTIONAL HARDWARE

- 3.1 RADIAL SHAFT VIBRATION AND AXIAL POSITION TRANSDUCERS
- M 3.1.1.3 b. Reverse mount, integral hex nut probe bodies are preferred.
- 3.4.2 SYSTEM OUTPUT RELAYS
- R * 3.4.2.1 Unless otherwise specified, casing vibration and bearing temperature shutdown features shall not be used.

IP 10-12-1		Vibration, Axial-Position, and Bearing Temperature Monitoring Systems for Compressors and Drivers (This practice is appropriate for attachment to Inquiry or Purchase Document)	
Page 2 of 3			
Rev. 2	June 2000		

	3.5	MONITORS
	3.5.1	GENERAL
R,M	3.5.1.1	q. (Exception) Time delays for shutdown shall be set at three seconds . s. The system shall be designed to permit removal and replacement of a monitor without causing a false trip , or monitoring system damage.
I	3.5.1.4	(Exception) Testing and maintenance facilities shall be per IP 15-7-2 .
M	3.5.1.5	Each monitor shall include an internal means of disarming the shutdown function. Individual channel bypasses are not required.
	3.5.3	RADIAL SHAFT VIBRATION MONITORING
I	* 3.5.3.4	When alternate voting logic schemes are required, they shall be specified.
I	* 3.5.3.6	If specified, monitors shall have trip set point elevation circuits to allow higher trip settings on operation of an external circuit.
	3.5.6	BEARING TEMPERATURE MONITORING
I,R	* 3.5.6.4	(Exception) Unless otherwise specified, bearing temperature monitor shutdown feature shall not be used.
	3.6	WIRING AND CONDUITS
M	3.6.1	GENERAL (Exception) Cable shall be run in rigid metal conduit . To facilitate maintenance, the final connection to each conduit box and the signal conditioner enclosure shall be flexible conduit. Conduit support shall be provided at approximately 2 ft (600 mm) centers.
	3.7	GROUNDING
O	3.7.1	The oscillator-demodulator or charge amplifier case shall be isolated from ground in the mounting box.
	3.8	FIELD INSTALLED INSTRUMENTS
R	3.8.2	Panel mounted monitors shall be air purged.

SECTION 4 - TRANSDUCER AND SENSOR ARRANGEMENTS

	4.1	LOCATION AND ORIENTATION
	4.1.2	AXIAL POSITION PROBES
R,C	4.1.2.1	a. (Exception) For high speed, special purpose gear units: Without thrust bearings - axially oriented transducers are not required. Single helical designs - shall be provided with two axial transducers per gear shaft at each thrust bearing end.
		b. (Exception) For A-C motors , axially oriented transducers are not required .
O	4.1.2.6	Probe centerline location shall be a minimum of one probe tip diameter from the shaft lathe center mark and from the shaft edge.
	4.1.3	PHASE REFERENCE TRANSDUCERS
I	4.1.3.1	a. (Exception) Phase reference transducer is not required on A-C motors , but shall be provided on the driven equipment . b. Phase reference transducers shall be provided for both shafts of two shaft gas turbines.
I	4.1.3.2	Phase reference transducer and one event per revolution mark shall be provided on the gear bull gear shaft and the driven equipment shaft or the gear pinion shaft.
	4.1.5	BEARING TEMPERATURE SENSORS
	4.1.5.1	Radial Bearing Sensors
R	4.1.5.1.1	(Exception) Two temperature sensors are required for each sleeve type journal bearing.
R	4.1.5.1.4	(Exception) Two temperature sensors are required for each tilt pad type journal bearing.