



BHOPAL

**HYDRO TURBINE ENGINEERING DIVISION**

**SPECIFICATION NO.**

**REV.NO.**  
**00**

**TITLE : SPECIFICATION OF SPEED SIGNAL GENERATOR (S.S.G.)**

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**PROJECT**

Speed Signal Generator (Toothed Wheel with Magnetic Pick Up) required as per the following.

**1. APPLICATION :**

The toothed wheel and magnetic pick-up is used to measure the speed of Hydro Turbine.

**2. SCOPE OF SUPPLY :**

- i) Toothed Wheel and its accessories as per BHEL Drg, No. 32084415032 Rev. 00.
- ii) Magnetic pick-up.
- III) Screen Cable with connector

**A. TOOTHED WHEEL :**

- (i) The material of the Toothed Wheel shall be M.S.
- (ii) The number of teeth on the Toothed Wheel is to be decided by the supplier and **approval to be Taken before start of manufacturing.**
- (iii) Toothed wheel shall be dynamically balanced.
- (iv) The toothed wheel shall be as per drawing No. 32084415032 Rev.00. However, dimensions of toothed wheel is tentative. Supplier has to take confirmation for final dimension before manufacturing from BHEL.


**B. MAGNETIC PICK-UP :**

- (i) The magnetic pick-up supplied shall be of either Electro-magnetic type or ferro-magnetic type and is Mounted near the toothed wheel (i.e. at a distance 0.5 to 2.5 mm.)
- (ii) The output of the magnetic pick-up shall be in square wave.

SPEED OF ROTATION		SQUARE ROOT OUTPUT	
		FREQUENCY	AMPLITUDE
0	R.P.M.	0 Hz.	0 V
600	R.P.M.	600 Hz.	10 or 22 V (Peak to Peak)
1200	R.P.M.	1200 Hz.	10 or 22 V (Peak to Peak)

**NOTE : SUPPLIER SHOULD TAKE CONFIRMATION OF SPEED OF ROTATION BEFORE MANUFACTURING**

REV.NO.		DISTRIBUTION.	QTY.	APPROVED :			
PREPARED							
CHECKED		HTE	01	PREPARED	CHECKED	ISSUED	DATE
APPROVED		MM(H)	06				
DATE							

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- (iii) The output frequency variation throughout range to be directly proportional to the speed of rotation and must be available at a distance not less than 50 meter.
- (iv) The output of the hall probe shall be perfect square wave work with mark and space ratio square 1:1. The Hall probe shall work at input voltage of 12 Volt DC & 24 volt DC respectively. The performance of Hall probe should be satisfactory irrespective of input voltage.  
  
The square wave output of the hall probe shall be maximum 10V peak to peak for 12V input sensor and shall be maximum 22 V peak to peak for 24 V input sensor
- (v) Details of sensor pin connection along with colour code to be furnished by supplier.
- (vi) **MOUNTING DETAILS (THREAD CONNECTION, DIAMETER & LENGTH) OF MAGNETIC PICK-UP SHOULD BE SUBMITTED ALONG WITH THE OFFER.**

**NOTE :**

- i) 12 or 24 VDC regulated power supply available with purchaser from Governor panel shall be fed to the Hall probe.
- ii) The output of the Hall probe is fed to frequency to voltage converter of speed measuring system and speed relay system supplied by the purchaser in the Electro-Hydraulic Governor.
- iii) The distance between the Hall probe & frequency to voltage converter is 50 meter so the supplier may quote booster amplifier separately or if not response shall be guaranteed for satisfactory output signal from frequency 1 Hz to 1200 Hz.

**C. SCREEN CABLE :**


Screen cable 50 meter each with connector at one end only. : 4 Nos.  
4 core screened cable shall be 300 V, un-armored, PVC insulated, multistrand, 7/0.2, 0.22 mm<sup>2</sup> screen cable as per IS 5608 ( Part III 1976 ).

**3. PACKING**

Each Hall probe shall be packed in a thermo Cole box with silica gel packet and placed in a carton or case with adequate cushioning material and water proof cover to minimize the movement of the internals and ensure that the instrument is capable of withstanding the transit conditions without damages. Tooth wheel shall be packed in a wooden box with anti rust coating material and water proof cover.

**4. DOCUMENTATION**

- i) Details, specifications and guaranteed technical particulars.
- ii) Q.A. Plan for our approval before start of manufacturing.
- iii) 3 copies of Test certificates after testing the equipment.
- iv) O & M Manual containing the following.
  - Operating principle
  - Mounting details
  - Calibration & adjustment procedure
  - Trouble shooting

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## 5. GUARANTEE

Equipment should bear supplier's guarantee for trouble free operation and good workmanship for a period of 18 months from the date of dispatch. Supplier should undertake to replace free of cost any material/ components found defective in operation during guarantee period.

## 6. TESTING

- Visual inspection.
- H.V. test & Megger test.
- Continuity test.
- Dimensional test.
- Performance Curve Speed Vs P.P.S. (Pulse per sec.).

## 7. INSPECTION

The inspecting agency shall certify that the testing has been witnessed as per APPROVED Q.A. Plan supplied by the vendor. Acceptance or waiver of inspection does not absolve the supplier of his responsibility to rectify the equipment in case it does not perform satisfactorily at hydro site where it is actually used.

**Please make sure before giving inspection call that Q.A. Plan and Test reports are submitted for Approval.**

## 8. STORAGE & HANDLING :

Supplier shall clearly mention the method of storage & handling in BHEL works/ Site for long storage. It shall also be mentioned if any special protection is to be provided for this purpose. The above should form part of O & M Manual.

## 9. IDENTIFICATION

Each Hall probes shall be identified with the following information.

1. Manufacturer's name or identification.
2. Manufacturer's model or Serial No.
3. Frequency, Input / Output range connection details.

The above information shall be engraved on the probe itself/ metal tag fixed permanently.

### NOTE :

**" BIDDERS ARE REQUIRED TO QUOTE ALL THE ITEMS AS PER SPECIFICATION AS A COMPLETE SYSTEM OF SPEED MEASUREMENT AND TECHNICAL INTERFACE TO AVOID ANY TECHNICAL COMPLECASY AT LATER DATE. OFFERS FOR PART SUPPLY SHALL NOT BE CONSIDERED. "**