INTERPLANT STANDARD - STEEL INDUSTRY		
IPSS	**SPECIFICATION FOR MEASURING SYSTEM FOR SPEED OF ROTATION (First Revision)** NO CORRESPONDING IS	**IPSS:2-07-026-97** **Formerly : IPSS:2-07-026-95**

0. FOREWORD

0.1 This Interplant Standard was prepared by the Standards Committee on Computerization and Automation, IPSS 2:7 and was adopted in 1997.

0.2 Interplant standards for steel industry primarily aim at achieving rationalization and unification of parts and sub-assemblies used in steel plant equipment and accessories, and provide guidance in indenting stores for existing or new installations by individual steel plants. For exercising effective control on inventory, it is advisable to select a fewer number of types from among those mentioned in this standard, for the purpose of company standards of individual steel plants. It is not desirable to make deviations in technical requirements.

0.3 In the 1995 version of the standard, some vital printing errors were detected. These errors have been corrected in this revision.

1. SCOPE

1.1 This Interplant standard specifies the system for speed of rotation which requires high degree of precision, accuracy and resolution and robust housing to give long term reliable service in normal steel plant atmosphere.

1.2 These are used for measurement of speed of rotation of any machine component either for monitoring or control purpose.

1.3 This standard considers only the digital speed sensors and its associated electronics.

2. TECHNICAL SPECIFICATION

The following elements form the total speed measurement system:

a) Speed sensor
b) Connecting cable
c) Conditioning electronics and monitor

2.1 Speed Sensor

2.1.1 Electromagnetic or Ferrostatic with trigger wheel or Eddy current or Photoelectric type.

2.1.2 Technical specification for speed transducer:

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2.1.2.1 Mechanical

a)	Mounting of sensors	:	Optional
b)	Material i) Sensor	:	Stainless steel, Nickel-Silver or anti-corrosion black anodised
	ii) Pole wheel	:	Any, including ferritic with or without bosh (Optional)
c)	Accuracy	:	± 0.02%
d)	Moment of Inertia of rotor	:	1.8 X 10^{-6} kg m^2 or better
e)	Torque at 20°C	:	0.01 NM
f)	Shaft load	:	Axial - Max 40 N Radial - Max 60 N
g)	Weight	:	Less than 1.5 kg of wheel assembly
h)	Type of protection	:	IP 55, 64,65, 66 or 68 as desired
j)	Vibration (10-2000 Hz) shock (11 ms)	:	100 M/82 1000 M/8
k)	Resolution	:	One digit increment in 4 1/2 digit display
m)	Maximum speed	:	10,000 rpm
n)	Environmental condition		
	Operating Temperature	:	0-150°C
	Storage Temperature	:	- 30°C to 150°C
	Humidity	:	95% R.H. or bette

2.1.2.2 Electrical Data

a)	Power supply	:	5 to 24 V dc ±5% max Max 205 mA without load
b)	Output	:	Pulses for eddy current & ferromagnetic type (1-50 KHz) & current for electromagnetics.

2.2 Connecting Cable

2.2.1 Required for connecting the speed sensors with electronics and monitors.

2.2.1.1 Mechanical Data

a)	No. of conductors	:	As per sensor output 2/4/8/12 Core, each core colour coded
b)	Type of conductor	:	Copper wire tinned Stranded - 19 x 0.15 mm Dia - 0.79 mm (22 SWG)

c)	**Insulation type**	:	**Cross linked co-polymer (such as Radox 125). Non inflammable, Halogen free, electromagnetic interference resistive.**
d)	**Screen type**	:	Copper wire braid tinned Wire dia - 0.07 mm Insulation - Plastic tape
e)	**Permissible bending radius for stationary configuration**	:	Cable dia — Radius 4.5 mm — 10 mm 6.0 mm — 20 mm 8.0 mm — 40 mm (Approx 5 times the cable dia for 8.0 mm)
f)	**Operational temperature**	:	$-55^{o}C$ to $+150^{o}C$
g)	**Max Temp. for 5 to 6 hrs**	:	$250^{o}C$
h)	**Self extinguishing property**	:	According to IEC 332
j)	**Length**	:	As per application

2.2.1.2 Electrical Data

a)	**Resistance per conductor at $20^{o}C$**	:	60 ohms/km or less
b)	**Voltage rating**	:	300 / 500 volt dc
c)	**Test voltage**	:	3500 volt dc
d)	**Core to core capacitance**	:	200 Pf/m
e)	**Switch point setting**	:	5 to 100% of range top limit with multi-turn potentiometer
f)	**Hysteresis of switching point**	:	0.5% to 10% of full scale of range

2.3 Conditioning Electronics & Monitor

2.3.1 Line Amplifiers - To be used with speed pick-ups when the distance between the sensors and instruments is more than 15 m.

a)	**Frequency input**	:	0.02 Hz to 50 K Hz, earth free signal ground
b)	**Input voltage**	:	50 mV to 100 V
c)	**Input impedance**	:	More than 100 K Onm in parallel with 1 uf capacitance
d)	**Trigger voltage**	:	0 to +3.5 V
e)	**Frequency output**	:	Square wave, 10 VPP, Earth free signal ground output impedance, 200 Ohm max, Capacitive loading with upto 1 mf

f)	Supply	:	12 V dc + 15%, - 10% Max 25 mA, or optional
g)	Casing	:	IP 65
h)	Operating temperature	:	0-75°C
	& R.H.	:	95% or better
j)	Mounting	:	Wall/Panel mountable.

2.3.2 Monitor With Relays

a)	Input	:	Output of the sensors as preferred
b)	Measuring range (frequency)	:	1 Hz to 50 KHz
c)	Input power supply	:	230 V ac + 15%, - 10%
d)	Output power supply	:	5 to 25 V dc
e)	Output for recorder	:	4-20 mA, or as specified
f)	Adjustable limit	:	0-100%
g)	Alarm contacts	:	Potential free contacts for (i) high (ii) Low (iii) Trip
h)	Contact rating	:	230 V ac, 5 Amp
j)	Size	:	To be specified
k)	Protection	:	IP 65
m)	Alarm indication	:	i) In front panel with LED display for each alarm contacts ii) For power supply OK.

2.3.3 Optional

1) Should have three input provisions from pickup and a can be selected from the switch on the front.

2) Should monitor the function of transducers by comparing the input frequency with each other.

3) This unit should check the supply current to instrument in event of power failure. Fuse failure should be additionally included by a signal lamp or LED on front.

4) Coupling of the sensor with the rotating body may be through gear or direct by flange.