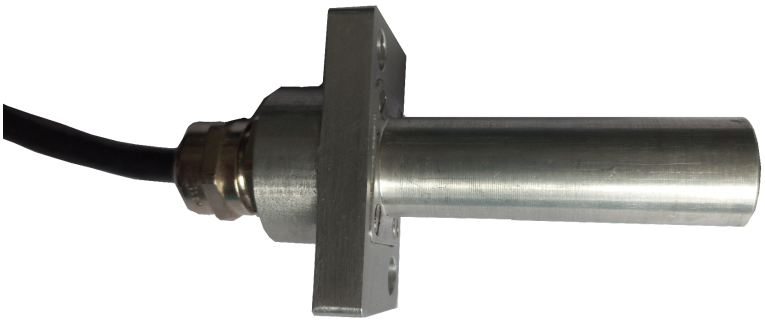
SPEED SENSOR FOR AC EMU

USER MANUAL

RELEASE 1.0

NOVEMBER - 2021



Submitted By

Advanced Rail Controls Private Limited
#59/1-2, G-Block, Sahakaranagar
Bangalore-560 092

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1.0 SCOPE

The scope of our offer is Supply of Hall Effect based Active Speed Sensor for Traction Motors fed from VVVF converters suitable for AC EMU traction motor type IM 3601 AZ. The product is designed based on CLW's Technical Specification No. CLW/ES/3/0528/ALT-A and will work in conjunction with IGBT based Traction converters.

The scope of supply for one set of Speed Sensor is given in **EXHIBIT-1**.

2.0 TECHNICAL DESCRIPTION

The working principle is illustrated in **EXHIBIT-2**. One Hall Effect Sensor is placed closely in the sensor housing (**EXHIBIT-4**) such that it is very close to the toothed wheel. Associated with the Hall Sensors is a biasing magnet placed in very close proximity.

An iron-toothed wheel (**customer scope**) having a uniform tooth pattern is mounted on the motor shaft. The toothed wheel must have 215 teeth. When the toothed wheel moves under the Hall-Effect sensor, the magnetic field linking with the sensor varies according to the tooth and trough of the wheel. The flux variation is measured by the sensor and amplified. The output of the sensor is square pulses with 50% duty ratio.

The final output coming out of the sensor is open collector type and the ground is common with the power supply ground. The power supply (+12V to 15V DC) is received from the electronic rack.

The salient data sheet of the speed sensor offered by us is given in **EXHIBIT-3** of this document.

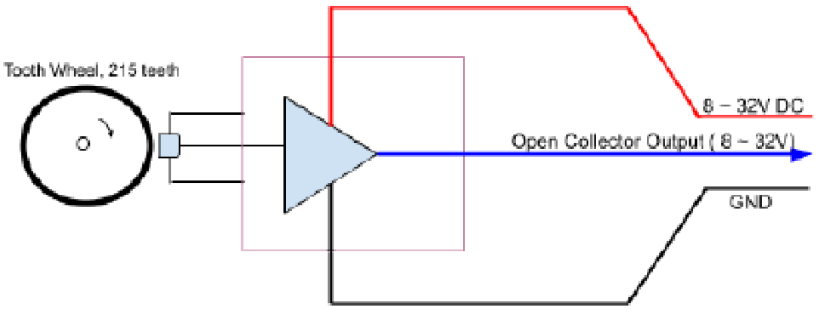
The output signal and power supply are taken using a four core cable EB irradiated and intended for traction application. The cable used is of 4x0,5 mm^2 EB irradiated cross linked type. The length of the cable is 300 cm. One end of the cable is kept free to enable the customer to crimp with any suitable connector.

The sensor is totally sealed to comply with IP68 ingress protection class according to IEC-60529.

EXHIBIT-1

SCOPE OF SUPPLY		
SL No	**Description of Sub-Assembly**	**Quantity/Speed Sensor**
1	Hall Effect based Active Speed Sensor, 215 pulses per revolution	01 No.
2	Tooth Wheel for Traction Motor, 215 teeth	OPTIONAL
3	Cable (EB irradiated, multi-core single cable (2 x 2 x 0.5 mm^2 twisted pair), one end connected with sensor through cable gland and other end free, Length – 300 cm	01 Nos.
4	Connector for Interfacing 1. Signal Connector 5 PIN circular connector type KPSE06E14-5SDZ 2. Power Supply Connector 3 PIN circular type KPSE06E12-3SDZ	OPTIONAL
5	The connector plate	OPTIONAL
6	Fasteners	OPTIONAL
7	Loco Side Connector	OPTIONAL

EXHIBIT-2



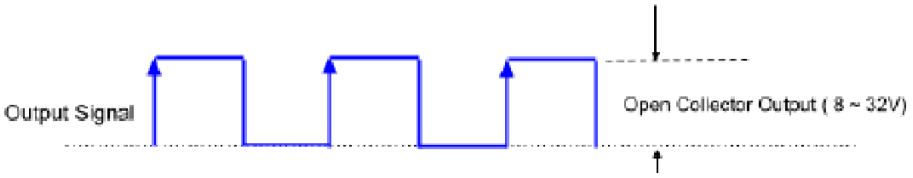


EXHIBIT-3

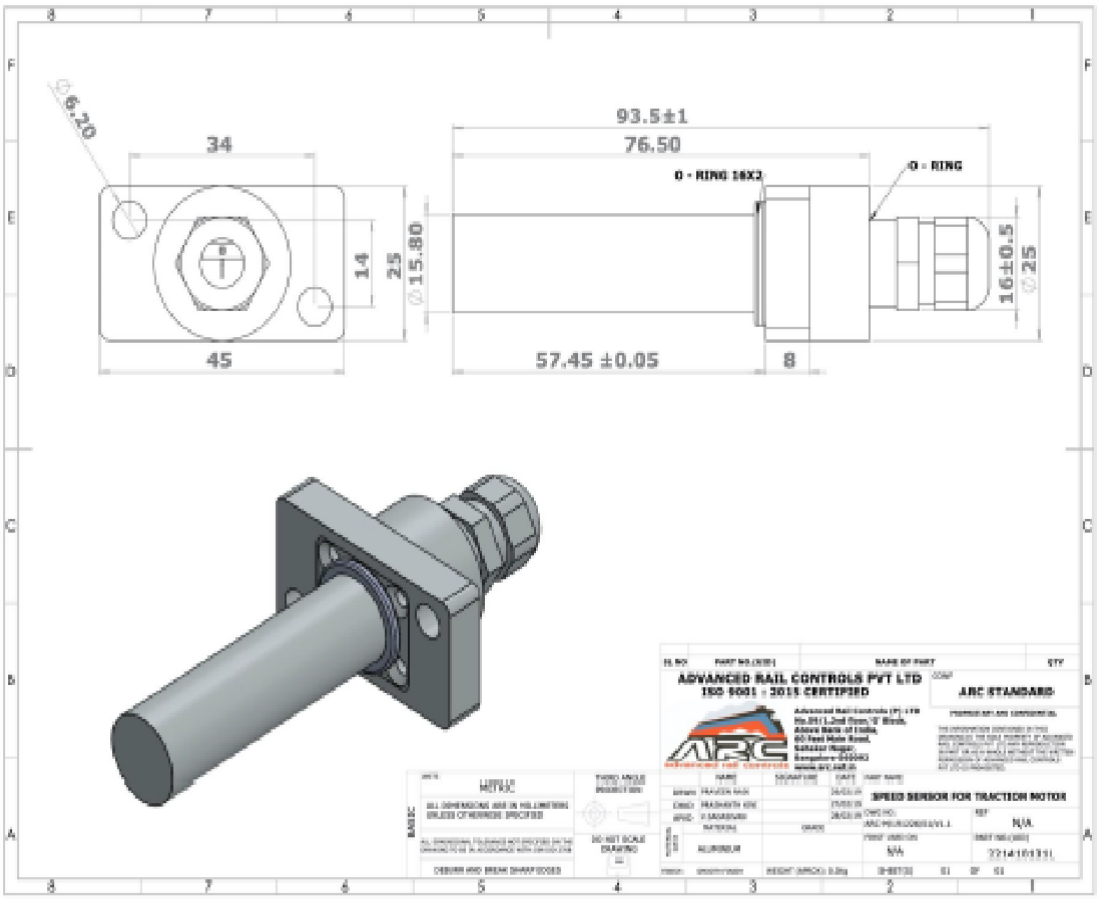
SALIENT DATA		
SL NO	**PARAMETER**	**VALUE**
1	Type	Active, Hall Effect Sensor Type
2	Sensor Input voltage	12V to 15V DC from Electronic Rack
3	Sensor Output	One Square wave Pulses, 50% (+/- 10%) duty ratio, open collector, short circuit protected. Signal ground common to power supply ground.
4	Output signal level	Signal Low: < 1.5V Signal High: > 10V
5	Sink current (Output)	$\leq$ 30mA
6	Source current (Input)	< 40mA
7	Pulse Frequency	215 pulses per revolution of motor shaft resulting in to 10.75 kHz corresponding to shaft speed of 3000 rpm.
8	IP Protection	IP68
9	Impulse Ring	Iron (MS) Tooth Wheel, Zinc Plated, 215 teeth (Not offered, in customer's scope)
10	Cable (Signal & Power)	EB Irradiated, multi-core single cable (2 x 2 x 0.5 mm^2 twisted pair) CLW approved make (3 cores used and one core is not connected)
11	Air gap	To be maintained between 1 to 2 mm
12	Cable length	3.0 Meters
13	Connectors	Cable is provided through a cable gland at the sensor end, the rack end is a flying lead.
14	Mounting dimension	As per exhibit-4

3.0 MECHANICAL CONSTRUCTION

The dimensional drawing of the speed sensor **TYPE 1** is given at EXHIBIT -4.

MECHANICAL DRAWING

EXHIBIT-4



4.0 CONTACT DETAILS

For any warranty/service-related queries, please contact

Bangalore HQ: RoyaPuram / Erode / Kalyan / Vadodara sheds
Mr. Manjunath. Naik, Head, Service Department, Advanced Rail Controls Private Limited, # 59/1&2, Above Bank of India, G-Block, Sahakara Nagar Bangalore-560 092 Phone: +91 80 42401212, +91 80 42401226 Fax: +91 80 42401213 Cell: + 91 9886610263 E-Mail: <mail@arc.net.in>, <manjunath@arc.net.in> URL: <www.arc.net.in>
Lalaguda / Vishakhapatnam / Kazipet / Vijayawada
Chaitanya. S [Base Station: Lalaguda] Cell: + 91 7989759891 Chaitanya. M [Base Station: Kazipet] Cell: + 91 7989247708
CLW / Dankuni
Rahul Deo Sharma [Base Station: Chittaranjan] Cell: + 91 9334804107
Piyush Prasad [Base Station: Chittaranjan] Cell: + 91 9386203249
Ajni / Itarsi / Bhusawal / Bhopal / New Katni
Pankaj Rameshrao Hedau [Base Station: Nagpur] Cell: + 91 9021090829
Ghaziabad / Tuglakabad / RDSO
Subhash [Base Station: New Delhi] Cell: + 91 9212846380
Pappu Kumar Shah [Base Station: Ghaziabad] Cell: + 91 8051402441
Tatanagar / Bandamunda
Vivek Kumar Mukhi [Base Station: Tatanagar] Cell: + 91 7762905971
Deepak Kumar [Base Station: Bandamunda] Cell: + 91 8144914896
Gomoh / Howrah / Kancharapara
Ravikumar Vishwakarma [Base Station: Gomoh] Cell: + 91 7050029319
Anchal [Base Station: Kancharapara] Cell: + 91 8092793337