



CASE STUDY

Magnetic Encoders with Programmable PPR for Conveyor Machinery

Project Summary

Project: Durable Encoders for Conveyor Machinery

Client: 24/7/365 Fulfillment Centers

Application: Controlling speed of packaging conveyors

Nidec's Role

Nidec Industrial Solutions provided a magnetic encoder, magnetic couplings, and a configurator tool to withstand the operating environment of 24/7/365 fulfillment centers, significantly reducing encoder failure rates.

Markets

- Conveyors
- Fulfillment Centers
- Material Handling
- Baggage Handling

The Challenge

Encoders on packaging conveyors have a very high failure rate in the field. The working environment of a fulfillment center produces a layer of dust on the glass disks of optical encoders causing them to fail. Additionally, the motor and off-axis shafts often have excessive runout which very quickly destroys the bearings of the existing encoder models being used.

Nidec Industrial Solutions encountered several fulfillment centers who were experiencing extremely short life spans on the optical encoders they were using. Another problem the fulfillment centers were facing was the difficult process required to change the Pulses Per Revolution (PPR) on the spare encoders that they were continually replacing.

Our Solution

In response to these challenges, Nidec Industrial Solutions replaced the existing optical encoders at these fulfillment centers with our magnetic AV4 encoder. AV4 provides magnetic durability in a compact encoder and is a drop-in mechanical replacement for many optical encoders. Unlike optical encoders, magnetic encoders have no optical glass disks to be compromised by dust, dirt and liquids. AV4 has our Wide-Gap technology which provides for 10-20X larger air gap between sensor and rotor than ordinary optical encoder designs. Our Wide Gap technology allows for resistance to vibration.



AV4 Configurator Tool

The second part of our solution is that the AV4 has a configurator tool option which allows the end user to program the PPR of the encoder in a matter of seconds using a computer, cell phone, or tablet. No more DIP switches! Simply plug the AV4 into the configurator tool, connect with the tool using wi-fi and change the PPR within seconds.

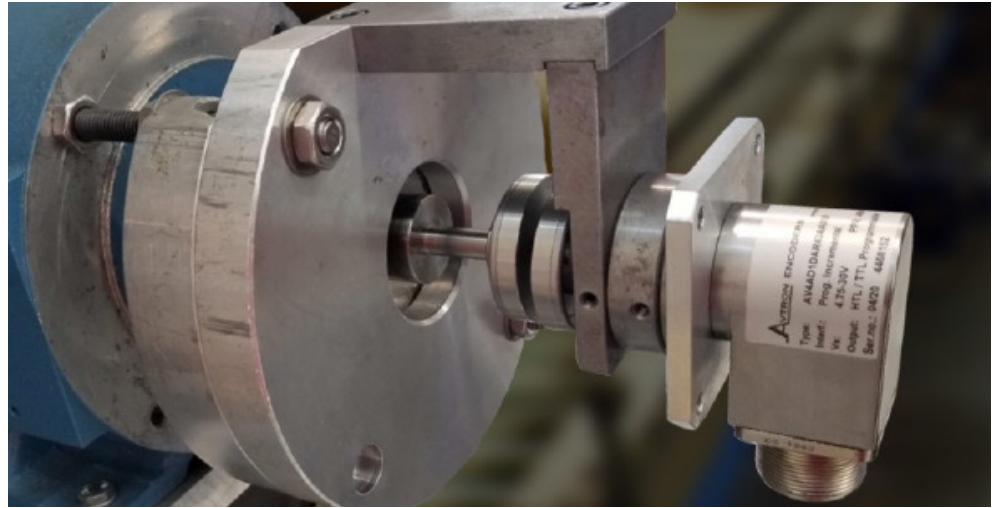
The fact that the AV4 is a drop-in replacement allows the end user to keep the same connector. In addition, our configurator tool allows the end user to program the AV4 to any PPR needed so it is only necessary to keep one type of encoder in stock.

The third part of our solution is that Nidec Industrial Solutions partnered with one of our premier distributors to develop a mounting system using magnetic couplings which eliminates the shaft runout that was destroying the previous encoder bearings and flexible couplings.

The competitor's previous set-up included the use of a flex coupling which allows for some shaft runout and reduces the amount of runout the encoder will experience. However our solution to use magnetic couplings prevents shaft runout from affecting the encoder at all. The magnetic couplings are two separate pieces, one mounts to the motor or mounting shaft, and the other mounts to the encoder. The magnetic couplings do not touch and so the runout is not transferred from one coupling to the other which prevents shaft runout from affecting the encoder.

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AV4 shown with mounting system and magnetic couplings.

Our solution incorporates the following:

1. our durable AV4 encoder
2. an innovative mounting system including magnetic couplings
3. our configurator tool which allows the AV4 to be programmed to any PPR (creating ease of inventory)

Results

We currently have several large 24/7/365 fulfillment centers using the AV4 with no failures experienced. The AV4 has exceeded the previous encoder life span by 400% and counting.

There are currently hundreds of Avtron Encoders operating in 24/7/365 industrial applications around the world. Avtron Encoder AV4 customers have experienced dramatically reduced encoder related downtime.

This mechanical flange mounting configuration is available, and we can customize the design to your specific application as well.

Contact us at: encoderhelpdesk@nidec-industrial.com



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