

Case story | VLT® AutomationDrive FC 302

Danfoss Drives optimizes process performance of pipe conveyor

Reduces wear and
tear & increases life
of the system by

40%

The Background:

During the last decade, pipe conveyor belts have revolutionised the way bulk materials are handled and transported. After loading, special idler systems fold these belts into a pipe, which encloses the material for the length of the run until the discharge point. Closed transportation prevents materials from overflowing, dropping down, scattering and mixing with foreign materials from outside. Enclosed conveying of materials thus is protecting the environment. This pipe conveyor belt is economical for curved (45°-90°) and inclined (up to 30°) transportation.

The challenge:

One such customer is a leading EPC contracting company, executing a PET Coke handling project for a refinery in India with a capacity of 900 tph. In the project, there was a scope of 1 km long pipe conveyor with 450 tph. This conveyor needs to be run with 3 induction motors of 90 kW at the head end.

Our client was driving innovation and sustainability in executing their first pipe conveyor project and was looking for a partner with expertise in VFD as well as in the application, and in support for complete project execution up to Performance Guarantee Test. As they have past experience the expertise and the quality of Danfoss products' efficiency in operations, commissioning, and the support, they decided to partner with Danfoss.

The three main goals of the investment were to

- reduce energy consumption
- optimize productivity and reduce the wear and tear of the mechanical components
- Improve process precision in motors

The solution:

Danfoss offered VLT® AutomationDrive FC 302 in the form of 90 kW VFD panel was designed and delivered for the 3 motors at head end. These drives operate in torque sharing mode. Danfoss supported the project seamlessly starting from drive selection, to delivering at the right time, through to commissioning of the system.

How Danfoss VFDs have helped:

When installed on the bulk material handling conveyor, VFDs helped the customer achieve the following benefits:

Equipment start-up control:

When started “across the line”, the induction motor can draw a significant amount of current, often as much as eight times the normal full load current normally drawn by the motor. Installing a Danfoss VFD substantially reduced this start-up current draw, reducing wear and tear on the induction motor for the conveyor belt and extending its life.

Similarly, a high current draw at start-up can affect a facility’s power distribution system. Installing a Danfoss VFD helped address this condition by eliminating voltage fluctuations and the amount of power required at start-up.

Torque, acceleration, and speed control.

Starting a conveyor motor without a VFD installed can create large and sudden amounts of torque, possibly inflicting significant mechanical shock and stress on the



motor itself as well as on any load present in the equipment. With a VFD, the amount of torque applied is accurately controlled, permitting equipment start-up at zero velocity with a smooth acceleration up to normal operating speed. In addition, with a VFD, a motor torque limitation threshold is set which prevents equipment damage in the event of a jam or other catastrophic event.

Installing a VFD allows operators to easily introduce variations in operating speed to equipment without shocking the load. A VFD can also enable reversed operation without the need for a reversing starter, and the device allows a controlled equipment to stop if desired. Adjustments to the VFD can even be introduced remotely to the VFD programmable controller, eliminating the need for speed adjustments to be done manually at the equipment.

Equipment Efficiency:

Since a VFD operates on the principle of programmable variable speeds, maintenance interventions to adjust equipment operating speeds can be eliminated. Finally, conveyors outfitted with a VFD consume less energy, which reduces the refinery’s energy bill.

Support right up to performance guarantee:

During the project, the customer had to re-configure their entire design. Danfoss supported their requirement by redesigning the changes in configuration as per customer requirements and assisted the team until completion of the project guarantee test.

While sharing his appreciation, The VP- Projects, of the EPC company, commented, ‘We would like to thank M/s Danfoss for their prompt support in after sales and service and hope to get the same support in the future.’

The conclusion:

The qualities of the VLT® AutomationDrive allowed one of the leading EPC company to reduce the complexity of automation of their induction motors that are spread across their conveyor belt. The belt is now automatically controlled by the drives.

The commissioning of four VLT® AutomationDrive FC 302 (up to 90 kW) at the refinery plant marks yet another successful cooperation between Danfoss and the customer.

Danfoss Industries Pvt. Ltd., Plot No. A-19/2, SIPCOT Industrial Growth Center, Oragadam, Kanchipuram District - 602105, India
Customer Service Center: 000 800 100 9289 | Email ID: danfoss.india@danfoss.com | Website: www.danfoss.in

Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material. Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product. All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.