DRIVE ENERGY SAVINGS AND EFFICIENCY WITH

HONEYWELL LOW-VOLTAGE DRIVES

Honeywell

CONTENTS PAGE

Application Notes

HONEYWELL
VARIABLE FREQUENCY DRIVES

Honeywell's energy-efficient variable frequency motor drives help you meet your automation requirements across a variety of industrial segments and process applications, ranging from small pumps to large compressors.

MVS100

MVIST

MVH100

Honeywell VFD offers a wide range of LV drives with the following key features:

- Seamless Integration
- Easy & Rapid Configuration
- Customization for your Application
- Efficient Operations
- Designed for Safety and Compliance

Honeywell Variable Frequency Drives (VFDs) are designed with application support in mind. There are three models of differing sizes and frequency ranges – from 0.4 to 500kw – making the solution suitable for a variety of applications.

- **MVS100** is a versatile, fit-for-purpose drive that improves the performance of mechanical devices and equipment. It offers a powerful PID function, a high degree of IP/ NEMA protection, and a range of user-defined function blocks.

- **MVIS7** facilitates precision control for specific applications. It combines closed-loop PID and multi-variable, sensorless vector control with advanced control algorithms.

- **MVH100** delivers energy savings and optimized control and operations for fan and pump equipment across various industrial applications. It provides specific function blocks for applications such as HVAC (damper control), chemicals and marine.

In addition, the space-efficient, compact design of Honeywell drives enables plenty of room for other equipment; and its compatibility with industry-standard BACnet, EtherCAT, Ethernet/IP and Modbus protocols ensures quick and easy integration with virtually any type of controller.

KEY FEATURES

MSV100
Standard Drive

- 1Ø 200V:0.4kW~2.2kW
- 3Ø 200V:0.4kW~15kW
- 3Ø 400V:0.4kW~75kW
- IP66 NEMA4X 3Ø 200V:0.4kW~15kW
- IP66 NEMA4X 3Ø 400V:0.4~22kW

MVH100
Fan and Pump Driver

- 3Ø 200V:0.75kW~18.5kW
- 3Ø 400V:0.75kW~500kW

MVIS7
High Performance Drive

- 3Ø 200V:0.75kW~75kW
- 3Ø 400V:0.75kW~375kW

FEATURES AND FUNCTIONS BENEFITING APPLICATIONS

Drives, motors, gears and bearings all play a very important role in keeping the productivity of your applications running. Choosing the right product with the correct features is essential in ensuring optimized production.

Drive + Motor Solutions

Input: 480V 3 Phase   Output: 415V 3 Phase
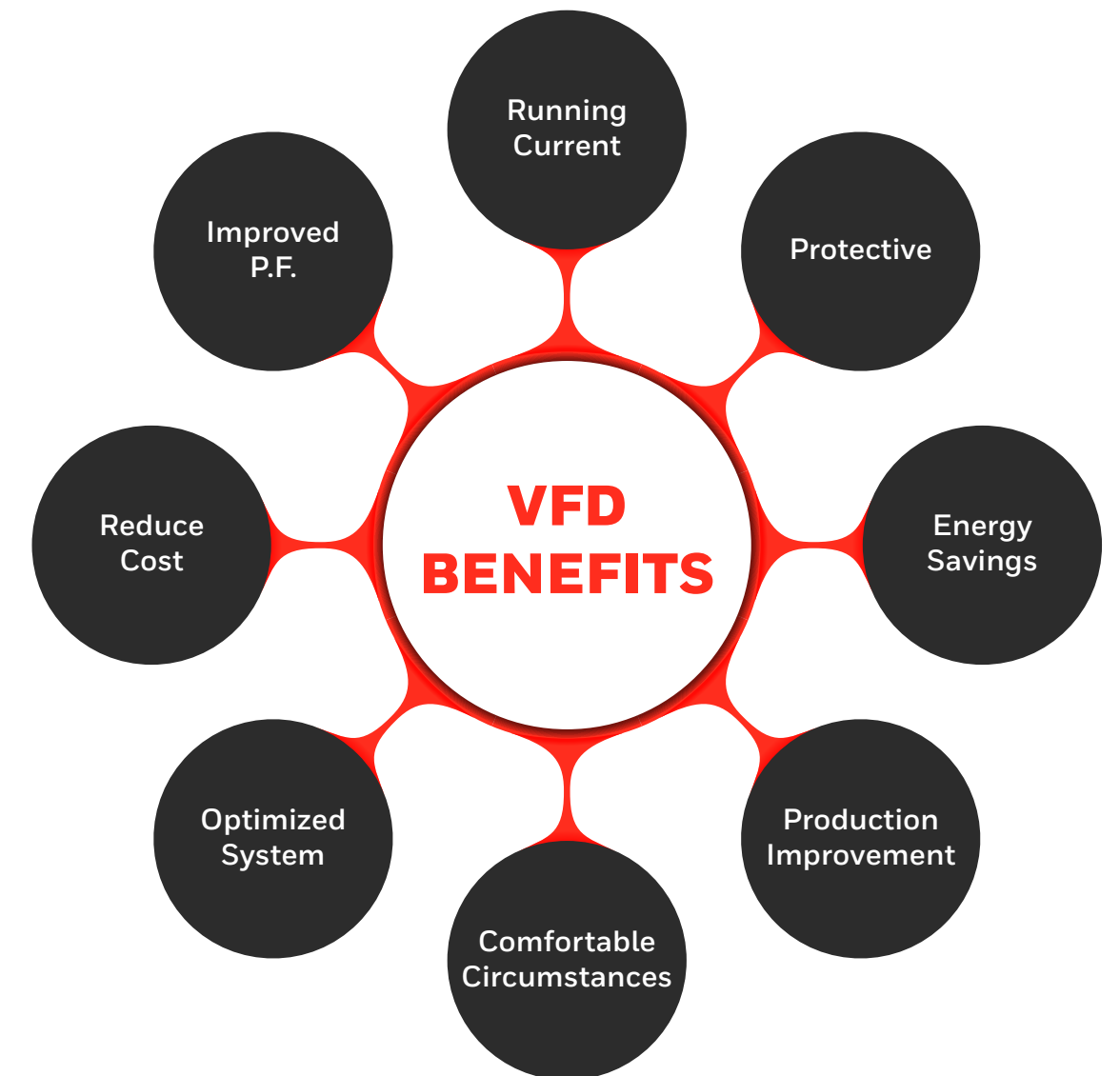
SUPPLY   M1 M2 M3
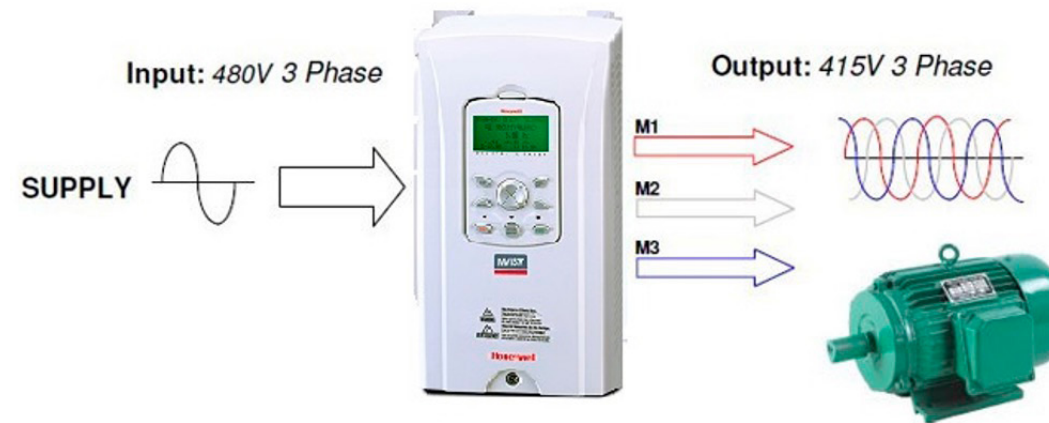
High-Efficient:

Save energy across your applications with highly efficient drive & motor solutions

Utility Packages:

Reduce energy, noise, vibration and maintenance cost using a solution and package that removes the gearbox from your applications

Globally Certified solutions:

Increase safety for employees and applications through conformity to global standards and regulations

VFD BENEFITS

- Running Current
- Protective
- Energy Savings
- Production Improvement
- Comfortable Circumstances
- Optimized System
- Reduce Cost
- Improved P.F.

APPLICATION NOTE
PUMP

INDUSTRY

Oil & Gas, Mineral, Food & Beverages, Petrochemicals, Organic & Inorganic Chemicals, Polymer, Ethanol, Starch Processing, Waste recycling, WWTP & STP, Refineries

APPLICATION OVERVIEW

A pump is a machine or mechanical equipment that is required to lift liquid from low-level to high-level or to flow liquid from a low-pressure area to a high-pressure area, or as a booster in a piping network system.

Principally, a pump converts mechanical energy from a motor into fluid flow energy.

Pumps can also be used in process operations that require high hydraulic pressure. This can be seen in heavy-duty equipment. Often, a piece of heavy-duty equipment requires a high discharge pressure and a low suction pressure. Due to the low pressure at the suction side of the pump, fluid will lift from a certain depth, whereas due to the high pressure at the discharge side of the pump, the device will push fluid to lift until it reaches the desired height.

Classification of Pumps

All pump types generally fall into two main categories:

- Dynamic (Centrifugal) Pumps – Energy is continuously added to increase the fluid velocities within the machine.

- Positive Displacement Pumps – Energy is periodically added by application of force to one or more movable boundaries of enclosed, fluid-containing volumes.

APPLICATION CHALLENGES

- High Inrush current
- Pump seizure
- Control and maintain constant flow during the process
- Maintain desired constant pressure
- Uncharacteristic noise and vibration
- Dry run
- Leakages
- Bearing and shaft failure

HONEYWELL OFFERING – AUTOMATION SOLUTIONS FOR PUMPS

Honeywell Automation Solutions are used in pumps in a broad range of industries – including HVAC, Water and Wastewater, and Oil and Gas. To overcome the challenges in pumps, Honeywell VFDs offer a series of unique features:

- Soft Fill function
- Pump Clean function
- Dry Run function
- Pre-Heat function
- Auto Scheduling

- Multi-Motor Control
- Pipe Broken Detection
- Broken Belt Detection
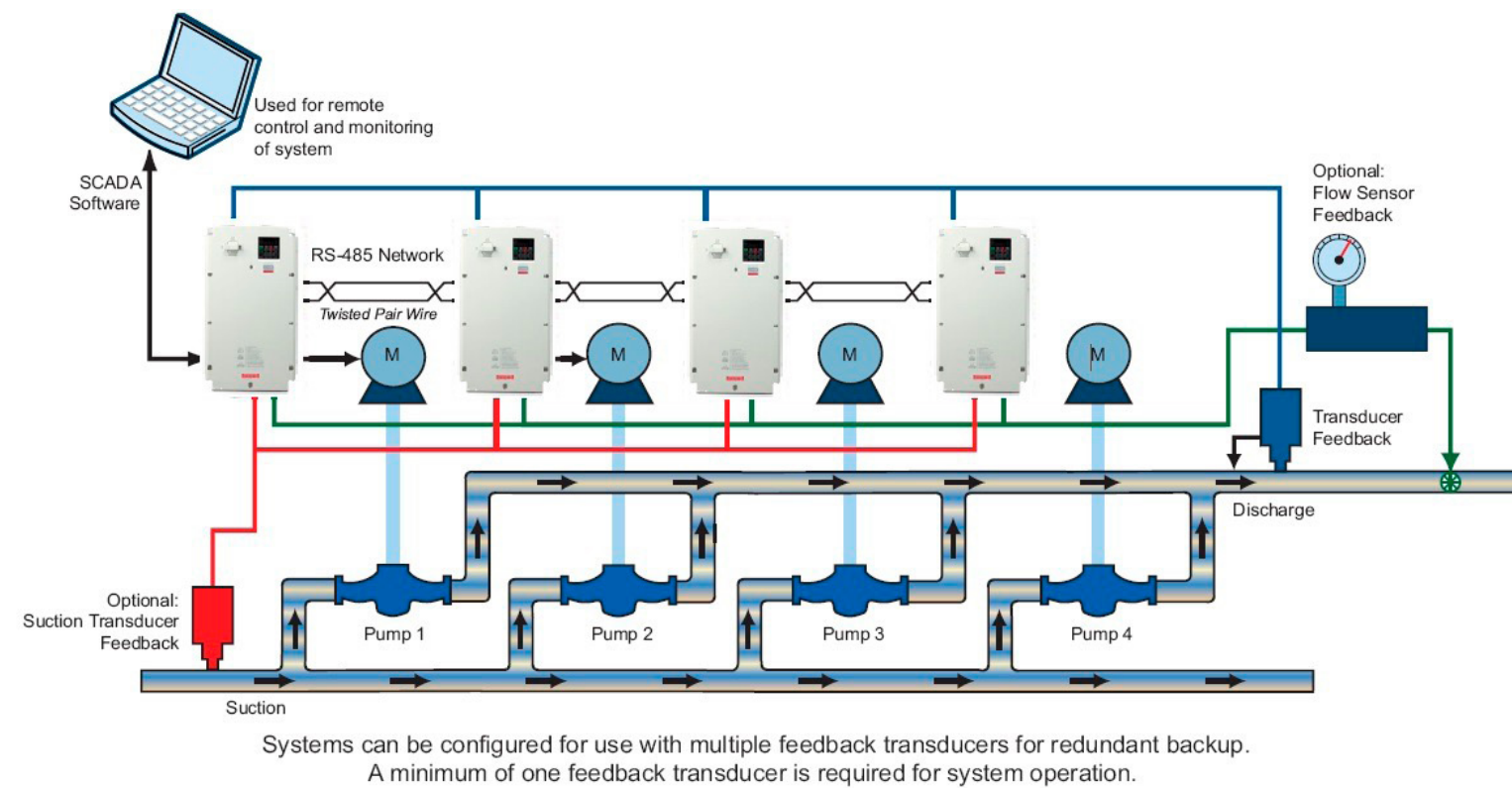- Flow Compensation
- Sleep-Wake function

Figure 1. Automation Solution for Pumps

Systems can be configured for use with multiple feedback transducers for redundant backup. A minimum of one feedback transducer is required for system operation.

This application is possible using Honeywell VFDs ranging from 0.4kW to 500kW.

Sample Case Study for Pump with & without VFD

ENERGY SAVING CASE-STUDY		
APPLICATION	PUMP	
MOTOR RATING	30KW / 40HP	
Parameters	Without VFD	With VFD
Running Frequency (Hz)	50	45
Average Running Amperes per hour (A)	58	49
Voltage (V)	400	400
Average Power Consumption per hour (kWh)	36.16	30.74
Total Running Hours in a day (Hrs)	22	22
Total Power Consumption in a day (kWh)	796	676
Total Power Consumption in a month (kWh)	23868	20288
Total Power Consumption in a year (kWh)	262552	223169
Unit Rate per kW (Rs.)	7.00	7.00
Total Cost in a year (INR) kWh * Unit Rate	1,837,862.61	1,562,183.22
Total Cost in a year (USD) kWh * Unit Rate	$ 23,562.34	$ 20,027.99
Total Energy Savings in kWh in a year		39382.77
Total Cost Savings in INR in a year		275,679.39
Total Cost Savings in USD in a year		$ 3,534.35
Approx. Cost of 30KW VFD Panel in INR		100,000.00
ROI in years		0.36

Benefits with Honeywell VFDs:

- Energy Savings in pumps with speed modulation – flow compensation.

- Smooth start & stop reduces mechanical stresses on the system – reduces high inrush current.

- Lowers maintenance costs – avoids pump seizure.

- Sizing optimization resulting in cost-saving – optimization in the selection of motors and switch gears for pumps.

- Electrical surges are avoided – auto torque adjustment based on load demand.

- Variable flow setting possible – user preference and application demand.

- Accurate flow and pressure control possible with the help of inbuilt PID.

- All motor protections are electronically provided through the drive. External protection devices can be eliminated.

- Pipe Clean, Dry Run, Scheduling, and MMC features are available for use.

- Integration facility available with Experion DCS & ControlEdge PLC or Third-Party controllers.

APPLICATION NOTE
COMPRESSOR

INDUSTRY

Oil & Gas, Pharma, Chemical, Mineral, Food & Beverages, Refineries, Organic & Inorganic Chemicals, Polymer, Ethanol, Starch Processing, Waste Recycling, WWTP & STP

APPLICATION OVERVIEW

The compressor is used to compress gas or a liquid to be used to drive either pneumatic or hydraulic equipment. It basically reduces volume & increases pressure. It is also used to convert the state of a substance, as in the case of air-conditioners, where the gas is converted back to the liquid medium by increasing pressure.

There are many types of compressors. These can be classified as:

- **Positive displacement** – These can be further classified as Reciprocating & Rotary Compressors (Screw).
- **Dynamic** – These can be further sub-divided into Centrifugal & Axial Compressors.

APPLICATION CHALLENGES

- Minimize the need for gears or belts to drive the compressors.
- Control and maintain speed during the process.
- Maintain desired constant pressure.
- Maintain desired flow.
- Uncharacteristic noise and vibration.
- Control wastage of energy during unloading conditions.
- Reduce maintenance cost.
- Compressor seizure.
- Bearing & shaft failure.

HONEYWELL OFFERING AUTOMATION SOLUTION FOR COMPRESSOR

Honeywell Automation Solutions are used in pumps in a broad range of industries — including HVAC, Water and Wastewater, and Oil and Gas.
To overcome the challenges in pumps, Honeywell VFD offers a series of unique features:

- Pre-Heat function
- Auto Scheduling
- Multi-Motor Control
- Pipe Broken Detection
- Broken Belt Detection
- Flow compensation
- Sleep – Wake function
- PID

SCHEME FOR COMPRESSOR

The working of reciprocating compressor has load/unload cycles. The following figure shows the typical compressor cycle.
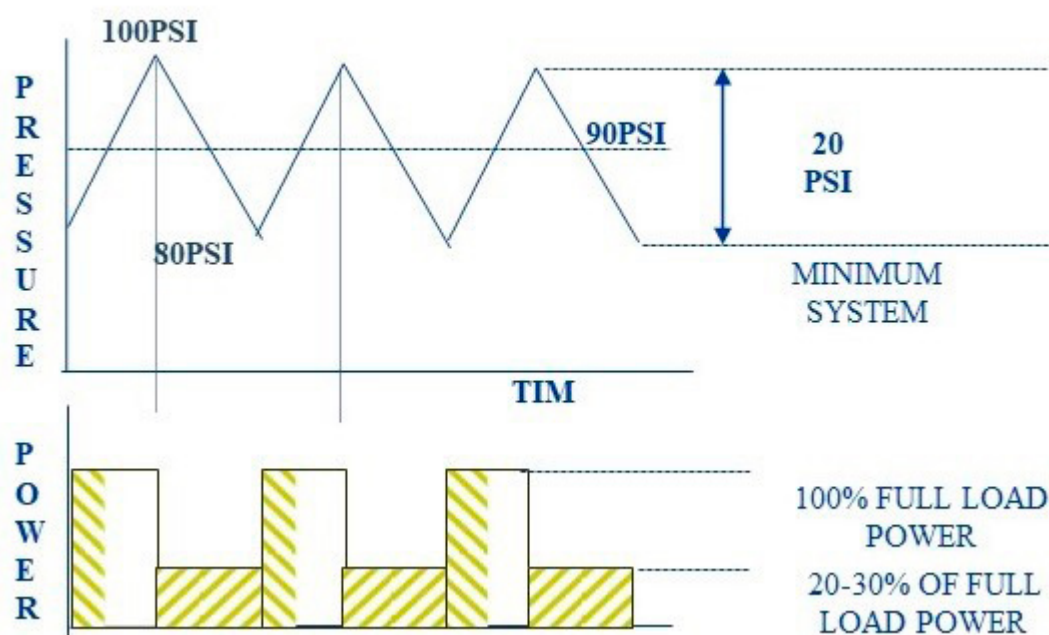
Figure 1: Control Schematic of Compressor

In the above load cycle, the requirement during unload cycle is 20-30% of power & the load to unload cycle ratio is 4:6 or even 3:7. That means, major of the time, the compressor is idle and is consuming energy. Also, the process pressure requirement is only 80 PSI, and an unnecessary pressure of 20PSI is getting generated, which means extra power consumption and waste of energy.

Instead of this Load-Unload scenario, we can achieve better control of pressure by employing a PID for pressure control. The scheme requires outlet pressure to be sensed by a pressure transducer employed as a feedback to the control mechanism. The scheme is as under:
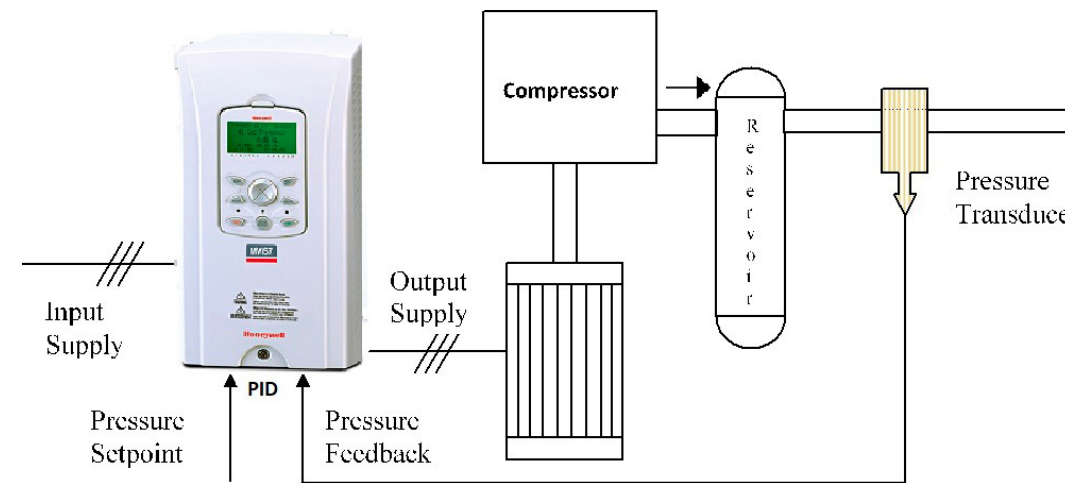

Figure 2: VFD for Compressor

The Screw Compressor is a continuous processing & will not have Load – Unload specifications. Yet, the air is controlled using an inlet valve, keeping the motor speed constant. So better efficiency and hence energy savings can be achieved by installing a speed control

mechanism that can regulate the volume of air. The application does not demand high starting torque, unlike the reciprocating compressor. The control can be very simple; therefore, it may not require a PID control

> **This application is possible using Honeywell VFDs ranging from 0.4kW to 500kW.**

Torque & Power curves:
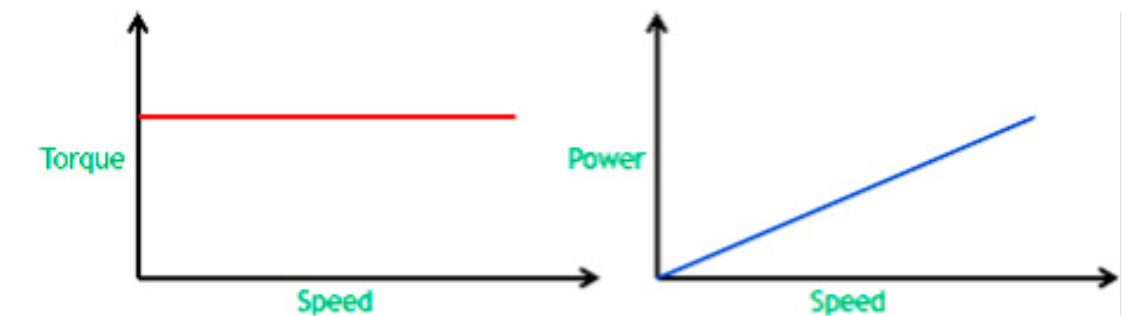
Acceleration torque demand is dependent on acceleration time & V/F applied to the motor. With full voltage start it can depend on the locked rotor torque, and with VFD start it depends on ramp time setting; however, the running torque will be more or less the same throughout the speed range. AS the torque load is constant, the power drawn will reduce proportionally with speed, but we should keep in mind that lower speed limits are required, as each compressor has its own mechanical limitations.

Sample case study for compressor with & without VFD

ENERGY SAVING CASE-STUDY CONSIDERING 20% UNLOADING		
APPLICATION	COMPRESSOR	
MOTOR RATING	75kW / 100HP	
Parameters	Without VFD	With VFD
Running Frequency (Hz)	50	42
Average Running Amperes per hour (A)	138	117
Voltage (V)	400	400
Average Power Consumption per hour (kWh)	86.05	73.14
Total Running Hours in a day (Hrs)	16	16
Total Power Consumption in a day (kWh)	1,376.73	1,170.22
Total Power Consumption in a month (kWh)	41,301.96	35,106.67
Total Power Consumption in a year (kWh)	454,321.61	386,173.37
Unit Rate per kW (Rs.)	7.00	7.00
Total Cost in a year (INR) kWh * Unit Rate	3,180,251.29	2,703,213.60
Total Cost in a year (USD)	$ 40,772.45	$ 34,656.58
Total Energy Saving in kWh in a year		68,148.24
Total Cost Saving in INR in a year		477,037.69
Total Cost Saving in USD in a year		$ 6,115.87
Approx. Cost of 75KW VFD Panel in INR		150,000.00
Approx. Cost of 75KW VFD Panel in USD		1,948.05
ROI in years		0.31

Important notes:

1. A minimum 20 PSI difference between loading & unloading is considered for the above calculations.

2. Panel cost may vary based on accessories installed, so we have worked with an average cost estimate.

3. If load pressure requirement is continuous, then energy savings are not possible, because VFD will have to run the motor at full speed in this scenario.

Benefits with Honeywell VFDs other than energy saving:

- Energy Savings in compressor while maintaining constant speed – flow & pressure compensation.

- Smooth start & stop reduces mechanical stress on the system – reduces high inrush current.

- Lowers maintenance costs – avoids compressor seizure.

- Sizing optimization resulting in cost savings – optimization in selection of motors and switch gears for compressor.

- Electrical surges are avoided – auto torque adjustment based on load demand.

- Accurate flow and pressure control possible with the help of inbuilt PID – user preference and application demand.

- All motor protections are electronically provided through the drive – external protection devices can be eliminated.

- Auto scheduling, Pipe break detection, Flow compensation, MMC features are available for use.

- Integration facility available with Experion DCS & ControlEdge PLC or third-party controllers.
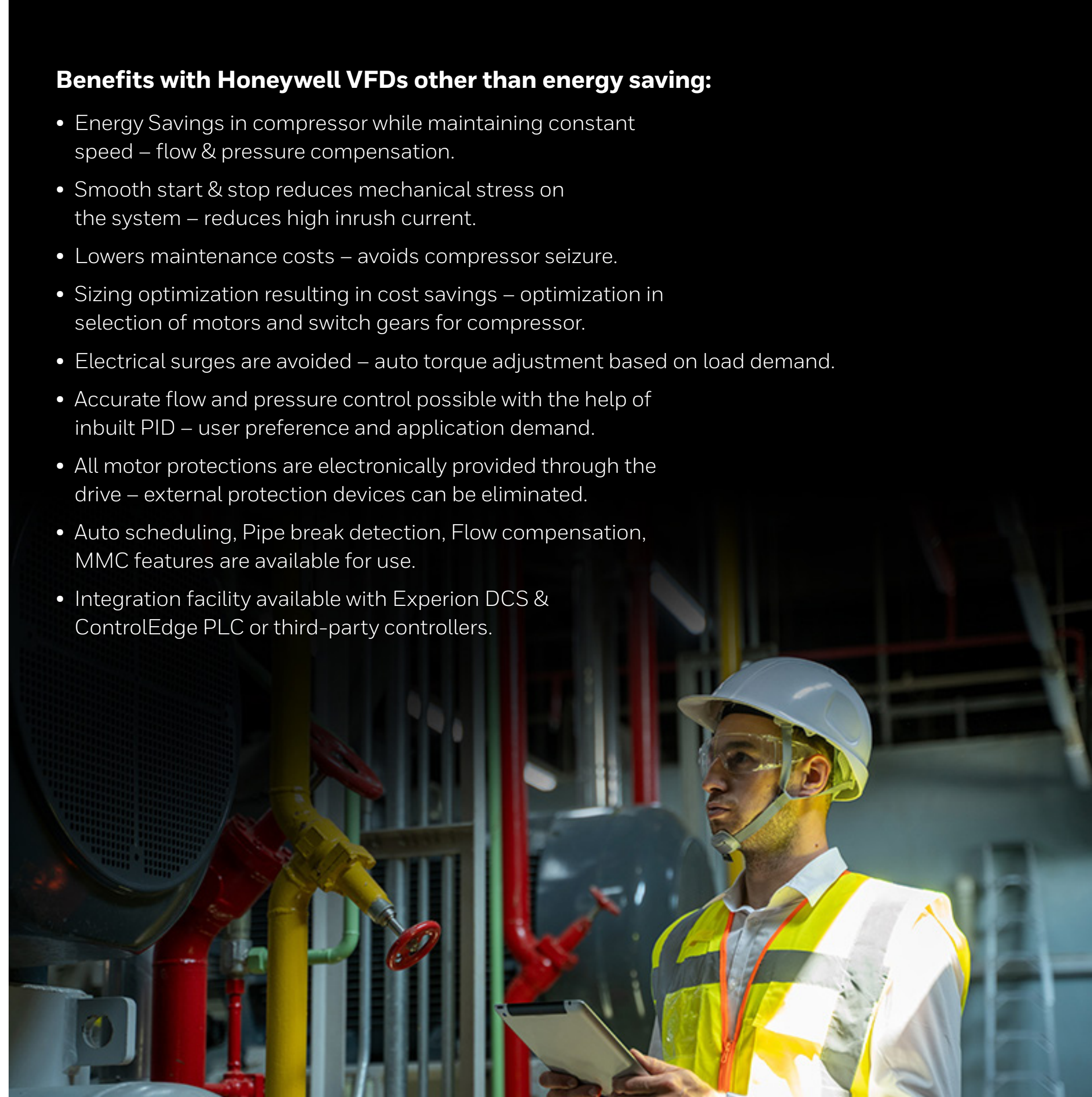
APPLICATION NOTE
DECANTER CENTRIFUGE

INDUSTRY

Mineral Processing, Oil & Gas, Food & Beverages, Petrochemicals, Organic & Inorganic Chemicals, Polymer, Ethanol, Starch Processing, Waste recycling, WWTP & STP

APPLICATION OVERVIEW

The Decanter Centrifuge is used to separate solid particles from liquids, in one or two phases, in one single continuous process. This is done using centrifugal forces that can be well beyond 3000 times greater than gravity. A main drive motor generates torque to turn the centrifuge. This main drive motor can be run using a VFD

The design of the Decanter Centrifuge consists of a solid container called a bowl which rotates at a very high speed. Inside the bowl tube, a scroll rotates in

the same direction, but at a slightly different speed. A differential gear is typically used to adjust the speed. The slurry is fed through a feed tube, which is inside a hollow shaft connected to a scroll. The slurry enters a feed compartment located inside the scroll and is forced through discharge nozzles to the bowl section. Once inside the bowl, the centrifugal force causes the material to separate. The screw conveyor moves the solids to the tapered end, where they are discharged. Clear fluids flow out the other end.

APPLICATION CHALLENGES

- Minimize the need for gears or belts to drive the centrifuge.
- Control and maintain speed during decanting process.
- Develop high torque at low speed.

- Two motor applications, one for the bowl and one for the scroll.
- The bowl has a very high reflected inertia.
- The scroll is usually in continuous regeneration, as it runs at a lower speed than the bowl and is pulled along.
- Torque limiting on the scroll is very important.
- Some configurations require zero-speed operation of the scroll (e.g., Differential Gearbox).
- Explosion-proof environment
- Uncharacteristic noise and vibration.
- Bearing and shaft failure.

SCHEME OF USING HONEYWELL VFDs FOR DECANTER CENTRIFUGE:

Honeywell VFDs are the best suitable drives for this application
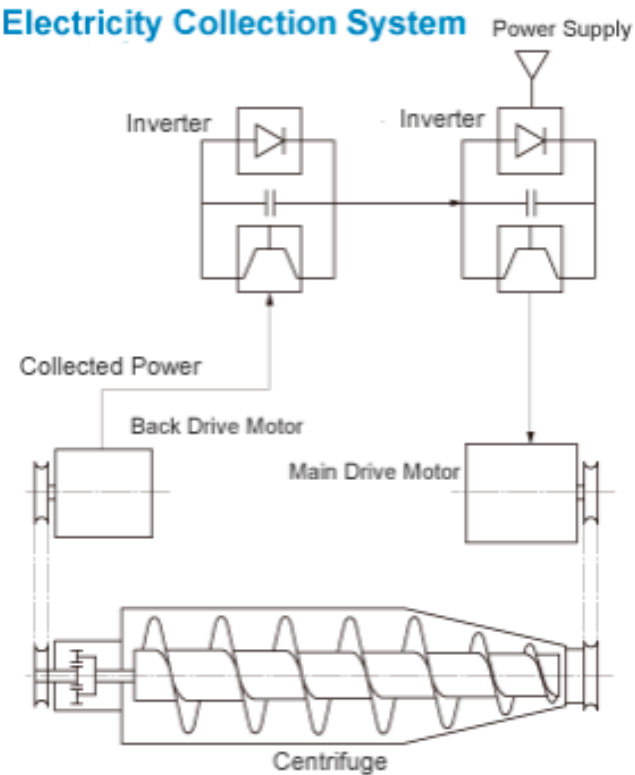
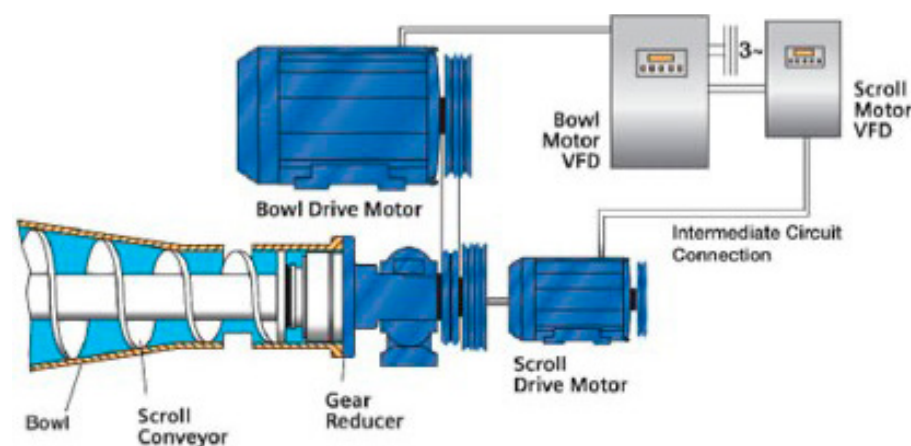Figure 1: Type 1 VFD Scheme for Decanter Centrifuge

Figure 2: Type 2 VFD Scheme for Decanter Centrifuge

Energy savings

- VFDs for the Main Drive and Back Drive units.

- This can bring optimal force and screw speed according to the treatment product.

- Also, by connecting VFDs for the Main Drive motor and Back Drive motor, the Back Drive motor acts as a generator and supplies the power to the Main motor.

Benefits with Honeywell VFDs other than energy savings:

- Reduces mechanical stresses on the system & lowers maintenance costs – Smooth start & stop function of Honeywell VFD.

- Sizing optimization resulting in cost savings – Dual Operation function of Honeywell VFD.

- Electrical surges are avoided – Programmable acceleration and deceleration feature.

- Variable Speed setting possible – Flexible speed control.

- Reduction in Noise – Adjustable Carrier frequency of VFD.

- Reduction in Vibration – Adjustable Carrier frequency of VFD.

- All motor protections are electronically provided through the drive; external protection devices can be eliminated – built-in protection features.

Remote monitoring solution – Integration facility available with Experion DCS & ControlEdge PLC or Third-Party controllers.
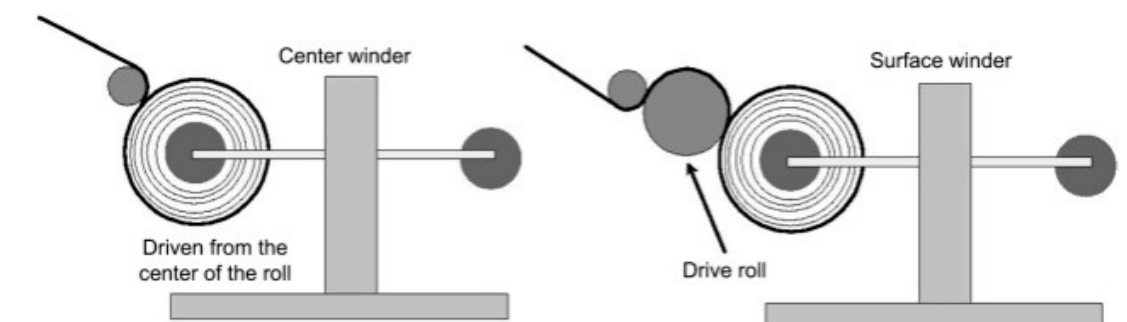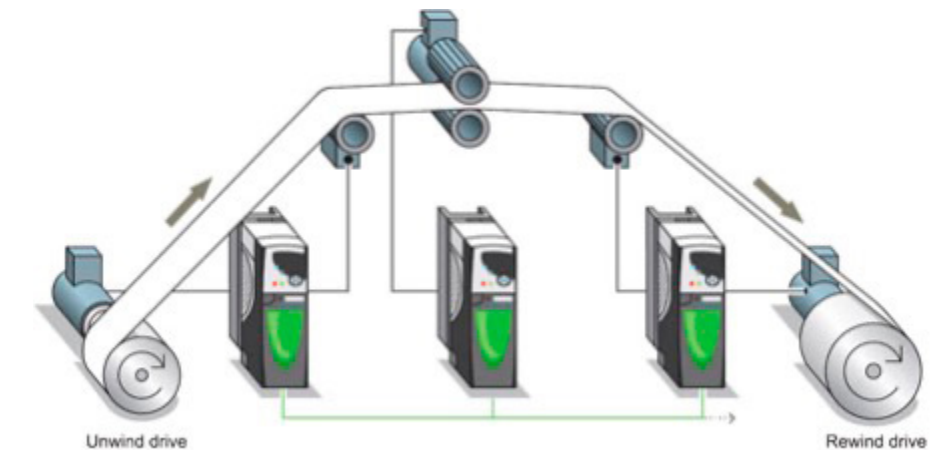
APPLICATION NOTE
WINDERS

INDUSTRY

Metal, Steel, Textile, Cable, Wire, Rope.

APPLICATION OVERVIEW

Winding is a procedure to take up and package material in roll form, for more efficient handling or in preparation for a subsequent operation. In a typical industrial use, a winder is employed to roll up a continuous or limited length of material such as wire, paper, film, metal, or textile. The winder and finished roll are referred to by different names in different industries, such as winder, take-up, coiler, spooler, etc. Rolls may be wound by applying drive torque at their center or their surface.

APPLICATION CHALLENGES

- Control of a motor under dynamically changing requirements.
- Acceleration to a fixed speed, deceleration to zero speed.
- Changes in speed and torque during operation.
- Detailed sequencing for flying splices and roll changing.
- Control of speed and torque.
- High process speed.
- Wide speed range.
- Changes in the processed material.

Unwind drive — Rewind drive

Center winder
Driven from the center of the roll

Surface winder
Drive roll

SCHEME FOR SELECTION & IMPLEMENTATION:

- Honeywell MVIS7 HD drive as per motors rated current & power.
- IS7 is best suitable for both open-loop and close-loop Vector Control.
- Potentiometer (2k-multiturn) 1 no. for torque limit in case of open-loop control & torque reference in case of closed-loop control. Line speed POT is optional, since speed reference can be through 0-10V / 4-20mA / digital.
- Encoder option card in case of closed-loop control using encoder. Dancer or load cell shall be incorporated with PLC in closed-loop control to obtain best results.
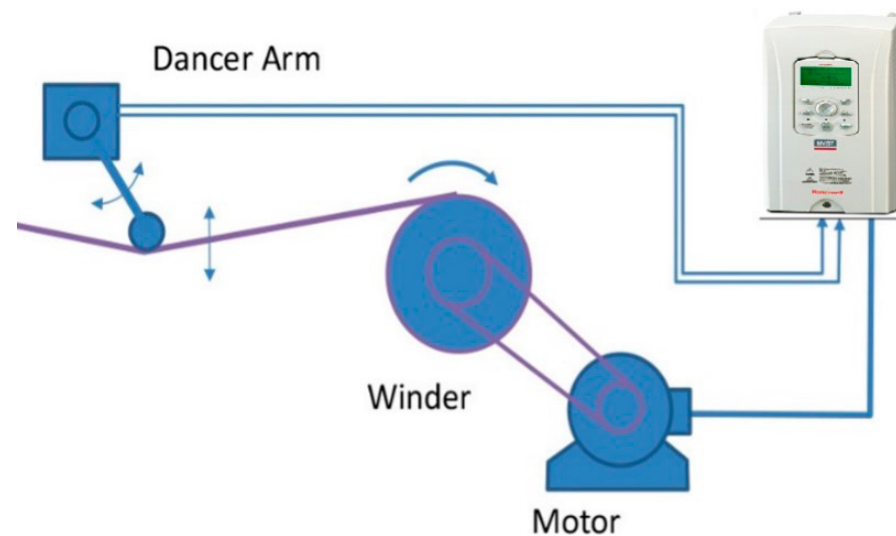

Figure 5: VFD Scheme for Winders

HONEYWELL IS7 VFDS DEDICATED FEATURES FOR WINDER APPLICATION:

- **Torque Limit Function**: This function is used to control the torque. Criticality of the system can be decided based on material thickness & line speed to be achieved.
- **Flux Vector Control & Torque mode**: Both torque and constant tension control are possible by using closed-loop Vector Control and Torque Control Mode.
- **PID Control Mode**: Line velocity control and diameter consistency can be achieved using the drives PID Mode with dancer position sensors, velocity sensors or diameter sensors.
- **Kinetic Energy Buffering**: KEB braking function can decelerate the application to stop without damaging the load, even when a power outage occurs. Simply coasting to stop can cause the wire to build-up or break.
- **Torque Detection**: This function senses wire breaks so that the drive can stop the application automatically.

APPLICATION BENEFITS:

- Precise control & smooth operation.
- Quality improvement.
- Productivity Improvement.
- Reduction in maintenance cost and manual errors.
- Long equipment life.
- Less wear and tear.

END-USER BENEFITS

- Higher system performance, better process control
- Faster startup, easier commissioning
- Better accuracy and improved decision workflows
- Standardized technology, lower lifecycle costs
- Easy and efficient asset lifecycle maintenance
- Seamless integration with various control systems
- Packaged Experion/ControlEdge solution for improved performance and support assurance
- Energy savings for Fan, Pumps, Compressors
- Backed by Honeywell's Total care service program for ultimate lifecycle benefits.

APPLICATION NOTE
STEEL INDUSTRY

INDUSTRY

Metal, Mining, Cement, Steel, Etc.

APPLICATION OVERVIEW: THE ROTARY KILN

The rotary kiln is the critical equipment in the sponge iron industry. Reducing iron ore to metallic iron (Fe), the kilns are widely used in cement and steel plants.

Production capacities in these plants largely depend on the rotary kiln's performance. That, in turn, is determined by key parameters, such as the temperature profile inside the kiln, the particle size of raw material, the ratio of air to coal, combustion of coal and heat transfer characteristics.

APPLICATION CHALLENGES

Achieving and maintaining rotary kiln performance and efficiency can be complicated by several critical challenges:

- High energy consumption, with the kiln the largest user of fuel and electricity in a plant.

- Continuous operation, with the kiln never allowed to stop

- High starting torque, and a need for accurate speed regulation and dynamic torque regulation

- Varying demand from changing production volumes, and inconsistent raw mix quality

- High inrush currents

- Uncharacteristic noise and vibration in the machine and motor

- Potential motor bearing and shaft failure.

Even without problems, accurate control is essential to ensure the kiln is used to its capacity, running costs are controlled and environmental standards are met.

HONEYWELL ROTARY KILN AUTOMATION

Honeywell automation solutions are used across metal, mining, steel, cement and other industries to achieve safer, compliant, more reliable, efficient and profitable operations.

Its MVIS7 Variable Frequency Driver (VFD) offers unique features to improve rotary kiln performance.

VFDs, also known as AC drives, provide precise speed and torque control to quickly and easily respond to changes in production volumes and raw mix quality.

With closed loop vector control and an advanced control algorithm, the MVIS7 delivers better performance and kiln control.

APPLICATION OVERVIEW: INDUCED DRAFT, SHELL AIR, CENTRIFUGAL DUCT AND AFTER BURNING CHAMBER FANS

Honeywell's MVS100 and MVH100 VFDs are ideal for a range of fan control applications across the plant:

Induced draft (ID) fans, used to draw out and remove flue gases from combustion chambers by creating a vacuum of negative air pressure.
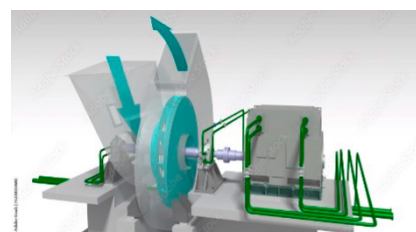
Shell air (SA) fans for rotary kilns in sponge iron plants, designed to ensure the right combination of volume and pressure.

Centrifugal duct (CD) fans, which extract air and fumes through medium/long sized ducts. They are suitable for applications on machines where forced ventilation or air suction is required.

After burning chamber (ABC) fans, used for the off gas cleaning system. Off gases moving in the kiln are at 1000°C and carry coal dust passed through the dust settling chamber and ABC. Air added into the ABC converts CO to CO_2

CHALLENGES

A wide range of fan control issues can undermine production safety and efficiency:

- Abnormal noise
- Alignment issues and problems with the belt drive
- Airflow due to slow fan speeds
- Blown fuses
- Loose pulleys
- Broken belts
- Seized bearing
- Vibration
- Impeller imbalance
- Complete fan failure
- Inaccurate speed regulation

HONEYWELL FAN AUTOMATION

To overcome these challenges, Honeywell's MVS100 and MVH100 VFDs are versatile solutions that help improve the performance of mechanical devices and equipment.

With unique features, they deliver energy savings and optimized control and operations.

APPLICATION OVERVIEW: COOLER MAIN DRIVE

In sponge iron plants, cooled water is supplied to the cooler main drive to cool the finished product. The water is pumped from the sedimentation tank and then re-circulated.
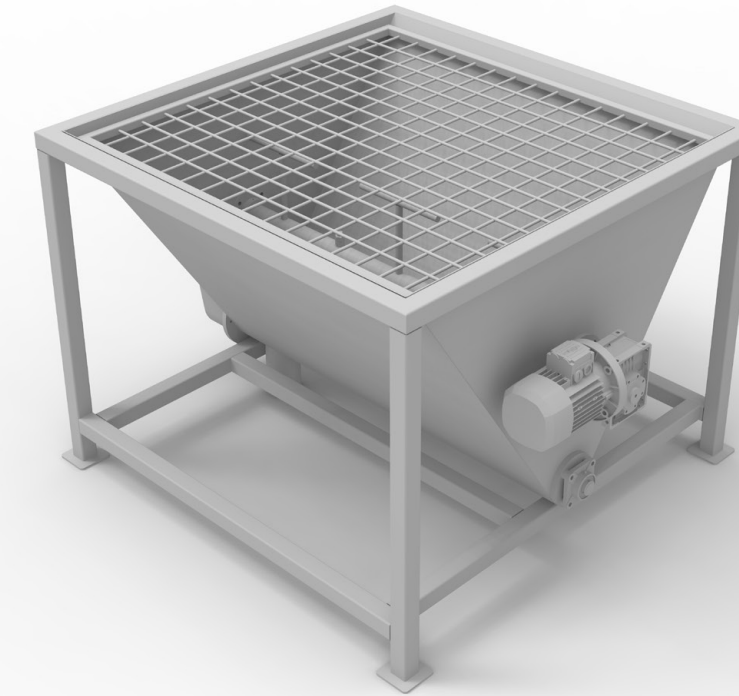
APPLICATION CHALLENGES

Common challenges for managing the process include the following:

- High vibration
- Abnormal noise
- Seized bearings
- Inaccurate speed regulation

HONEYWELL COOLER MAIN DRIVE AUTOMATION

Honeywell MVS100 and MVH100 VFDs, again, offer a versatile, fit-for-purpose solution to managing the process.

Helping improve the performance of mechanical devices and equipment, they deliver energy savings and help optimize control & operations.

APPLICATION OVERVIEW: VOLUMETRIC FEEDER

The Volumetric Feeder is a dosing system that supplies the production system with a specified volume of material in a set timeframe, based on the so-called displacement principle.

APPLICATION CHALLENGES

Challenges and problems for volumetric feeding include the following:

- High Vibration
- Abnormal Noise
- Alignment issues and problems with the belt drive
- Loose pulleys
- Broken belts
- Seized bearings
- Inaccurate speed regulation

HONEYWELL VOLUMETRIC FEEDER AUTOMATION

Honeywell MVS100 & MVH100 VFDs provide a versatile, fit-for-purpose drive for operating volumetric feeders.

Improving the performance of mechanical devices and equipment, they bring unique features for energy savings and optimized control and operations.

APPLICATION BENEFITS OVERVIEW

Honeywell VFDs bring a wide range of benefits to sponge iron applications across the metal, mining, cement, steel industries. They offer a powerful and versatile solution with applications in rotary kilns, fans, cooler main drives and volumetric feeders that promote improved operating performance:

- Energy savings with flow compensation for fans and compressors.
- Reduced mechanical stresses and high inrush currents with smooth start and stop
- Lower maintenance costs through avoidance of equipment seizure
- Cost savings from sizing optimization for machines according to motors and switchgears
- Auto torque adjustment based on load demand to avoid electrical surges
- Variable speed setting according to user preference and application demand
- Accurate flow and pressure control with the help of inbuilt PID
- Integrated electronic motor protections, eliminating the need for external protection devices
- Integration available with Experion DCS and ControlEdge PLC or third-party controllers

FURTHER SALES OPPORTUNITIES

Building on the installed base, open opportunities for Honeywell VFDs are likely to include the following:

- Power plants adjacent to the sponge iron plant
- OEMs and consultants for kiln manufacturers
- The cement industry
- LSTK offerings.

SERVICE
AND SUPPORT

From installation and start-up to system maturity and future expansion, Honeywell TotalCare remote and on-site support services ensure you get maximum return from your automation system investment.

The TotalCare Service program features specially designed service package options in addition to Honeywell's standard support commitment under the Scalable Control Solutions portfolio. Available on an annual subscription basis, TotalCare Lite and Enhanced service packages encompass system updates, upgrades, corrective and preventive maintenance, support requests, and more. Factory-trained remote service engineers provide technical support and rapid responses to queries regarding procedures, documentation, operation, service, training, and system enhancements. In addition, TotalCare remote services include a review of operational procedures, software analysis, and diagnostic evaluations when required.

THE FUTURE IS WHAT WE MAKE IT.

Honeywell Process Solutions

1250 West Sam Houston Parkway South
Houston, TX 77042

Honeywell House, Skimped Hill Lane Bracknell,
Berkshire, England RG12 1EB UK

Building #1, 555 Huanke Road, Zhangjiang
Hi-Tech Industrial Park, Pudong New Area,
Shanghai 201203

process.honeywell.com

Honeywell