KĀDANT AES

Unigy

Introducing Unigy™, a revolutionary pump drive that provides you with unprecedented control of your system at a fraction of the cost. Unigy™ pump drives and systems are an ultra efficient way of reducing energy consumption, pump wear, operational noise and the expense of external instrumentation that is required for conventional variable frequency pump drive systems.

Unigy Eliminates

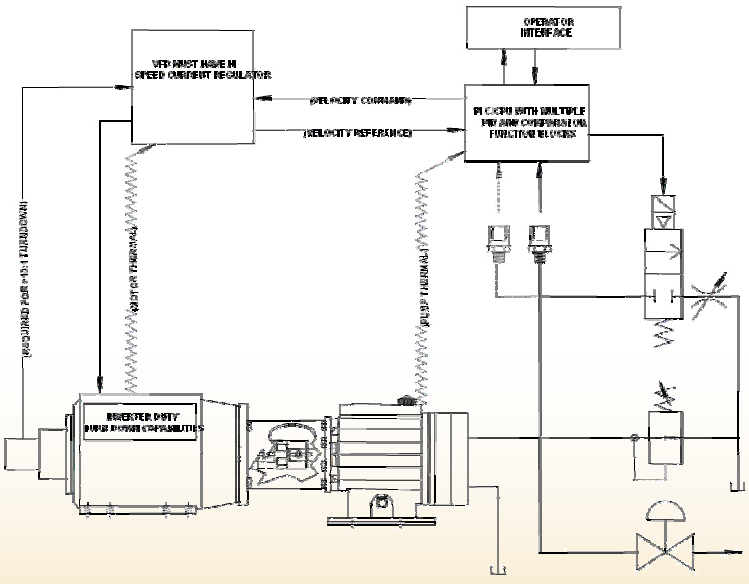
- Pulsation Dampeners
- Pressure Regulating Valves
- Soft Starters
- Pressure Switches
- Flow Meters
- Heat Exchangers
- By-Pass Recirculation Loop
- Controller Programming
- Interfacing of Instrumentation
- Pump System Noise (< 80 dBA Without and Enclosure)

Functions Include:

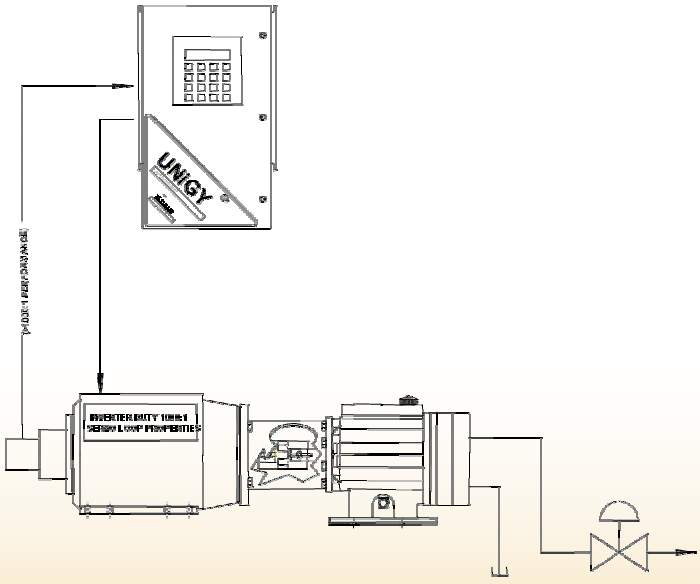
- Indication of:
  - Operating Pressure
  - Flow Rate
  - Worn or Clogged Spray Nozzles
  - Leaking Pipeline
  - Worn Pump Components
- Data Logging of:
  - Flow Rate
  - Pressure
  - AMPs
  - Voltage

  And 14 Other Unique Processes

Conventional VFD Pump System



Unigy Pump Systems



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Unigy™ - What is it?
Kadant AES developed a pump drive that has the look and feel of a variable frequency drive, but offers significantly more control over pump performance. A Unigy™ drive receives its' control feedback from the very motor it drives – much like a microphone by using MCSA (motor current signature analysis), incremental shaft encoder and applies this "invisible" information to feed forward geometry properties of the driven pump in real time. This is inherently more accurate and less cumbersome than receiving feedback from external instrumentation in the process line.

A variable frequency drive is a generic device designed to alter the electrical frequency to the motor it "controls". This is done by programming the desired RPM or by executing user programmed modules that are receiving data from external devices such as flow meters and pressure switches. The level of control that can be obtained is directly related to the complexity of external instrumentation providing feedback to the VFD. This is an expensive way to "control" a fluid system, both in component cost and time spent programming. There is also the issue of stacked accuracy tolerances and individual component reliability as well as the motor/drives torque handling capabilities throughout the delivery range.

A Unigy™ drive is a custom made pump controller that uses *pump torque vs. shaft position to control performance*. Unigy™ drives use a motor shaft encoder that outputs 8,192 data points per shaft rotation. This "little black box" essentially translates this data to become an instantaneous response method to process variations.

Everything that happens in your fluid system, from a worn or plugged spray nozzle to a broken hose has unique and immediate effect on the torque of the motor. Knowing what the "torque loop", "velocity loop" is doing in comparison to the "position loop" enables the drive to identify points on the curve with individual events such as "clogged pump inlet check valve" providing unprecedented control of your pumps. Furthermore this control is provided with a much higher degree of accuracy, that requires no external input components nor programming skills.

Advantages of a Unigy™ Drive for Pumping Systems

Turn Down. Unigy™ drives enable infinite turndown. You can maintain line pressure at 0 GPM through the full flow capacity, meaning you do not require a pressure regulating valve to maintain line pressure.

Energy Savings & Pump Wear. A typical high pressure pump system flows at a capacity greater than the required flow with the pressure being maintained via the accuracy of a spring or bellvue washer style pressure regulating valve. The bypassed flow varies depending upon the number of nozzles in service, how worn they are or if there's clogging. This bypassed flow is wasted energy; it was generated at high pressure and not used. This type of system requires a recirculation loop, which is difficult to implement for large scale (distributed) nozzle networks. Pure fluids and temperature sensitive applications also benefit from non-recirculating systems as the energy used to heat or chill a fluid goes directly to the process. In addition to the significant reduction in kWh used, the pump components see less use, so everything lasts longer.

Ultimate Flow Control. With a Unigy™ drive the pump shaft only rotates at the required *torque and velocity* to satisfy the setpoint(s) and these can be pressure or flow related, a combination of both, or even related to the pump's mechanical wear to indicate when the pump efficiency has decreased for scheduling maintenance. This means that as a nozzle clogs, wears or when a line bursts the pump speed adjusts in milliseconds to either provide more, less or no flow as required. To that degree, all this "translated torque vs. velocity vs. shaft position information" is data-logged and available for review or can be used for performance manipulation (automatic or manual). Unigy™ drives are remote addressable and can contact the user by email or text messaging to indicate the operating status (like a burst hose).

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Call us today to explore how Unigy™ can simplify your system design, increase reliability and reduce costs!

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