

Tailored AC drive modules launched for water and waste water applications

ABB industrial drive ACSQ810

Hanover, April 20th 2009 – A series of low voltage AC drive modules, dedicated to applications in the water and waste water sector is launched by ABB. The easy-to-install and use ABB industrial drive modules are available from 1.1 to 400 kW in the voltage range 380 to 480 V and are suitable for single pump and parallel pumps systems.

Although specifically designed with in-built intelligent pump features, the drive modules can be used for other water and waste water applications such as fans, providing significant energy saving potential across all applications. The modules are engineered for easy configuration and use by system integrators, OEMs and end-users, thereby reducing a plant's total costs through quicker installation and commissioning.

In-built intelligent pump functions

When used as part of a typical pumping system, the drive module's in-built intelligent pump functions contribute to high energy saving and reduced carbon dioxide (CO₂) emissions as well as maximum uptime of the water and waste water processes. The intelligent pump functions comprise:

- Flow calculation which provides the drive with a flow meter routine which very accurately determines the flow rate within a process. This function avoids the need for costly external flow meters and is suitable for applications where the flow data is not needed for invoicing purposes.
- Soft pipe filling which provides a pump with soft-start enabling a smooth build-up of flow in pipes while increasing the life time of the pipe work and pumping system.
- Sleep & boost which is suitable for clean water pumping systems, during night time when water consumption falls. This function detects slow rotation and runs the pump to boost pressure prior to shutdown. The pressure is continuously monitored and pumping restarts when the pressure falls below the minimum level.
- Pump cleaning which is used in waste water pumping stations to prevent pump and pipes clogging by initiating a sequence of forward and reverse runs of the pump to clean the impeller.
- Multi-pump control which is for applications where several parallel pumps are operated together and the required flow rate is variable. The function provides the most energy efficient way to operate parallel pumps.
- Redundancy which provides system redundancy, so should one or more pumps fail or require maintenance, the remaining pumps continue operating. Overall maintenance time and cost are decreased.
- Shared information which shares data between drives connected in parallel for multi-pump systems. This function makes IO cabling connections easier and faster, helping to reduce



installation cost.

- Level control which is used to control the filling or emptying of waste water storage tanks. The function prevents sediment build-up on the tank walls by randomly varying the surface level within a range preset by the user.
- Pump auto change which balances the operating time of all the pumps in the parallel pumping system over the long term. This helps to increase the mean time between repairs and reduce service costs.
- Pump priority which is intended for systems where the consumption rate varies based on demand. This allows for better maintenance planning and can boost energy efficiency by operating pumps closer to their best efficiency point.
- Pump specific protections which help to maintain disturbance-free operating time in a process.

Energy saving at the heart of the drive

In pumping systems, where a variable output is often required, energy consumption costs can be dramatically cut by using a low voltage AC drive, such as the ABB industrial drive module, to control motor speed, rather than operating it at full speed or throttling the output. Up to 50 percent energy savings are possible along with reduced carbon dioxide (CO₂) emissions and payback on the investment can be typically within two years.

All the energy and CO₂ savings generated by the drive module are easily monitored using the built-in energy counter, which displays energy savings in kWh, or local currencies. Energy consumption is compared to previous time frames defined by the user and if there is an energy consumption increase, an alarm is generated.

An additional energy saving function called energy optimizer is designed into the drive. The energy optimizer is a software-based algorithm generated by a highly advanced motor model developed by ABB. This further enhances the energy efficiency of a pumping system. With the energy optimizer, when a pump system operates at partial load, the motor magnetizing current is reduced, thus lowering the losses of the motor and drive. This means that the total efficiency of the drive system is maximized. Improved efficiency has a direct impact on the energy costs. The energy optimizer is enabled through the drive's control panel and when initiated it also results in a lower motor noise level which benefits the operating and maintenance personnel working with the equipment.

The drive's internal fan has an automatic on / off control which provides further energy savings by switching the cooling fan off when the drive is not active.

Advanced macros and assistants

The drive has pre-programmed application macros that can be used in both single pump and multi-pump systems to configure the drive to control typical pumping tasks. The user is helped by an intuitive user interface with several assistant screens. These include start-up assistant to guide the user through all essential settings; a maintenance assistant that indicates preventative maintenance needs of a drive, motor or pump; and a diagnostic assistant that helps locate failures or reasons for performance changes and suggests remedies.



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