

New ABB E-Clipse Bypass takes technology for back-up motor control of HVAC devices to entirely new level

(Even in bypass mode, the new ABB E-Clipse Bypass talks continually with Building Automation Systems)

NEW BERLIN, Wis., January 22, 2008 . . . ABB today released the next generation of bypass technology in motor drives, which are used throughout the HVAC (Heating Ventilation & Air Conditioning) industry. Calling it “a bypass with brains,” the new ABB E-Clipse Bypass is the next paradigm shift in electronic bypass design-- ideal for wall mounting and/or fitting into air-handling units and pumping packages on all types of OEM equipment used in the HVAC industry.

“Bypass technology is used in conjunction with nearly two-thirds of all drive installations for motor control in HVAC applications,” notes Jeff Miller, vice president, commercial sales, ABB Low Voltage Drives. “Bypass technology allows building managers to keep motors in constant-speed operation, if and when drives need to be maintained, or fault for some reason. Such operation can be critical, particularly for ensuring intake- and exhaust-air fans operate during all conditions, including fire,” he said.

Ideal Back-up

The new ABB E-Clipse Bypass is the first design to communicate, like ABB’s drives, directly with Building Automation Systems. “That keeps facility managers in total control of all their HVAC requirements, even in conditions where electrical challenges may trip out the drives. It’s an ideal back-up technology and device that is a brand new development for this market,” Miller said.

This introduction significantly extends ABB’s first E-bypass design, introduced in 1998. Worldwide, there are more than 100,000 E-bypass installations in operation. Further study of this market – its applications and requirements – resulted in the new product line, which is being introduced to the market at the international AHR (Air-Conditioning, Heating, Refrigerating) Exposition in New York.

ABB E-Clipse Bypass – Technology to the Next Level

The ABB E-Clipse Bypass takes the full digital microprocessor-based controls pioneered in the first E-bypass “to the next level – a seismic advance,” according to Mike Olson, manager, HVAC applications. “The technology incorporates new capabilities that answer the needs of the changing and evolving customer and market requirements.”

Available in a UL Type 1, UL Type 12 or NEMA 3R enclosure – and integrated with ABB’s ACH Drive^{IT} Low Voltage 550 adjustable-speed AC drives -- the two-contactor bypass features both a service switch that disconnects the drive for service, and a main disconnect switch or circuit breaker. The dual switch eliminates downtime, since the motor/load never needs to go offline; this back-up feature – ensuring uninterrupted operation – continues to make bypass drives the preferred choice among more than half of all commercial applications, according to ABB.

Common Protocols are Standard Feature; Control Through All Conditions!

The ABB E-Clipse Bypass includes the more common HVAC protocols as standard features. Included in every



bypass shipped are Modbus RTU, Johnson Controls N2, Siemens FLN, and BACnet communications protocols. Other protocols, such as LonWorks, Profibus-DP, Ethernet/IP, Modbus TCP, DeviceNet and CANopen, are available as plug-in option cards.

This next-gen bypass technology also extends the serial communications for VFDs that ABB pioneered for the HVAC industry in 1994 – and resulted in more than 150,000 units (in the U.S., alone) connected to building automations systems, using these various communications protocols. “And now the ABB E-Clipse Bypass includes serial communications **in the bypass mode**” noted Olson, “which means that, for the first time, going to bypass does not mean losing control but, rather, keeping control through all conditions!”

“In all previous designs, switching to bypass mode meant the VFD displayed as a failed point on the building automation system network,” noted Olson. However, via the ABB E-Clipse Bypass, serial communications to the bypass controller now ensures there is no loss of communication or control, and no failed point on the BAS network. “The VFD may even be removed (and sent back to the factory for repair, for example) from the system with no loss of communications,” said Olson. And the BAS system still can start and stop the application and monitor amps, volts, and kilowatts hours – in bypass mode.

Multiple Data Points from Bypass to Master Controller

Over 45 individual points of data are communicated between the bypass and the BAS system master controller. For example, the operator can monitor all safeties, damper end-switch proofs, and any other digital inputs to the system. In addition, the operator can start and stop the bypass over serial communications or force the system into override mode.

Proof-of-flow, over-temperature conditions, or other system warnings may also be displayed on the BAS master controller. Finally, all faults can be displayed at the master controller along with remote system reset capability via communications.

In 1997, ABB pioneered VFD serial communications pass-through I/O. Pass-through I/O enables users to monitor all digital inputs on the variable frequency drive, and control all relay outputs and analog outputs on the variable frequency drive. The pass through I/O now is widely adopted by the more progressive temperature-control contractors as a method of reducing system costs, according to Olson.

Why is this notable? For example, a BAS integrator now can use the VFD relay outputs to start a lag pump drive, open an isolation damper, or control any auxiliary device that required a maintain-contact closure for operation. In addition, all digital inputs such as damper-receipt proof contacts, safeties, or supply-fan run interlocks to the return fan can be monitored over the building automation system through the VFDs I/O.

However, using the VFDs I/O for control of the system inherently meant that if the VFD was in a non-operational state, and any ancillary devices that were being controlled through the VFD’s I/O were also non-operational. “The ABB E-Clipse bypass addresses these concerns,” said Olson. “With the ABB E-Clipse bypass, I/O remains available to the BAS system even with the VFD removed. The BAS system integrator/end user now has complete confidence that even if the drive were to fail, any ancillary devices being monitored and/or controlled using the system I/O available is still functional - even in the bypass mode.”

Easy-read Display

The new ABB E-Clipse Bypass includes a dedicated, plain English display for advanced annunciation. The display is capable of indicating which (of up to four) unique safety inputs have opened. The user can choose from a predefined list of eight different safety names for display on the keypad and display on the BAS system master



controller. For example, one digital input may be assigned the name “FireStat.” Another digital input may be programmed to display “FreezeStat.” In addition, the keypad will display (in English) all bypass diagnostic, warning and fault indications.

Previous Features Integrated into New Design

All key features in ABB’s original E-Bypass have been integrated into the new design, according to Peter Walter, product marketing manager for ABB HVAC drives. These features include: run-permissive circuitry (damper control with end-switch proof); drive exclusive fast-acting fuses; proof-of-flow (broken belt) indication and action; motor single phase protection; no contactor chatter guaranteed through a voltage tolerance range of +30%, -35% of nominal voltage; two Fireman’s overrides; keypad control with one-line diagram and status indication LEDs; programmable Class 20 or Class 30 electronic motor overload protection; and selectable manual or automatic transfer from drive to bypass.

ABB, Automation Products, Low-Voltage Drives, is a leading supplier to the U.S. HVAC market, and has connected tens of thousands of drives to building automation systems via serial communications. In the USA, ABB, New Berlin, Wisconsin, supplies a complete line of energy-efficient electric drives and motors to HVAC and commercial customers through an integrated channel of sales representatives. Products manufactured include AC and DC variable speed drives from fractional to 500 horsepower. HVAC single-motor drive applications include supply & return fans (air handlers), exhaust fans, fume hoods, re-circulation pumps, condenser fans; multiple-motor applications include multi-cell cooling towers, paralleled chilled water, and booster pump systems (<http://www.abb.us/drives>).

ABB (www.abb.com) is a leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs more than 110,000 people.



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The new ABB E-Clipse Bypass features an easy-read, plain English display to make reading it easy on both the unit and the BAS system master controller.

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