MAGNETEK
MATERIAL HANDLING
ELECTROMOTIVE SYSTEMS

MagnePulse™ Digital Magnet Control

Frequently Asked Questions

Q: What information is required to quote a MagnePulse DMC control package?

A: To properly quote a DMC control package the following application information is needed: the magnet's cold current rating, magnet voltage, DC bus voltage, maximum ambient temperature, and desired enclosure type.

If the operator control switch is not a standard Lift-Drop switch, please specify the desired control method. Such control methods may take advantage of the drives programming features: Cast, Dribble, OmniBeam™, analog control etc.

If pilot devices are controlled by the magnet controller, please specify their voltage and current requirements.

Q: Where will the customer see a Return on Investment (ROI) when upgrading from traditional contactor technology to the MagnePulse DMC?

A: When compared to standard contactor control the end user will find:

Increased Production Throughput

- The DMC lowers cycle times by decreasing lift and clean times. These features are configurable for almost any magnet application using the DMC; the DMC regulates current, not voltage, this minimizes the variation in control performance found in contactor controls which typically regulate voltage.

Reduced Energy Costs

- Reductions from 20 ~ 60% can be realized utilizing the hold, auto clean, and timed clean features, making each cycle more repeatable.
- Minimizing the magnet's duty cycle reduces the magnet's temperature, which means the magnet can produce its maximum lifting force. This guarantees the magnet is moving the most load per cycle.

Replacement Costs

- The MagnePulse DMC utilizes only one contactor, which is not switched under load, nearly eliminating electrical wear. Typical reversing magnet controllers utilize four contactors, each of which are switched under load and typically arc across the tips.
- Because the DMC minimizes the magnet's temperature and voltage spikes the magnet wear is decreased, reducing the frequency of costly magnet repairs.

Q: Will the MagnePulse DMC work with existing operator controls?

A: Yes, Magnetek has designed the control firmware to work with Lift, Lift-Drop, Stepped, and Analog operator controls. Additional programmable features have been added to supplement your crane's current functionality, such as decreased lift, cast, temperature alarm, and external fault, etc.

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Q: What support is available for the MagnePulse DMC?

A: Magnetek will provide the same support our customers have come to expect with all of our control and power delivery products and automation systems:

1. Over-the-phone technical support — 24 hours a day, 365 days a year.
2. Two-year warranty.
3. Fast turnaround on repaired products.
4. Manual and product documentation available on the web.
5. Product instruction and troubleshooting available via our training course at our Menomonee Falls, WI facility or at your site.

Q: Can the MagnePulse DMC operate on the same bus as contactor magnet controls?

A: Yes, but it is important to understand the switching characteristics of the contactor magnet controls employed. Typical 230 V contactor magnet controls can induce a reverse switching voltage between 400 and 1,000 VDC. Voltage rises above 400 VDC will cause an overvoltage fault on the DMC. In these cases it may be desirable to install a common-bus RPM panel to limit the bus voltage below 360 volts or consider upgrading all contactor magnet controls to MagnePulse DMC controls.

Q: **Why is it important to consider the rectifier type when applying the MagnePulse DMC?**

A: The reason for concern on the type of supply voltage feeding the crane is due to the potential of compatibility issues, which could affect the overall package cost.

Voltage regulated SCR supply can induce voltage transients, therefore we may supply:

- DC line choke to avoid overvoltage nuisance tripping

AC ripple can cause problems, because the capacitor passes AC current through

- AC ripple should be measured (more often a problem with voltage regulated SCR supply) if possible, and may require DC line choke
- AC voltage ripple will increase the DC bus voltage and possibly cause over voltage trips
- AC current ripple will increase the RMS current flowing in the circuit

Q: How are the MagnePulse DMC controls sized to individual magnets?

A: For single magnets, the magnet's cold current rating should be used to size the DMC's current class. The control's current rating must exceed the magnet's cold current rating.

If the magnet's cold current rating is below 20 ADC, an external CT board should be included with the 133 A model. If ground fault detection will be enabled, a second external CT board is required for proper fault detection.

The control's voltage rating should be scaled according to the incoming line voltage. Consult Magnetek Material Handling for applications with DC bus voltages exceeding 320 VDC.

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Q: How should the MagnePulse control be sized for multiple magnet beams?

A: The MagnePulse controls should be sized for the sum of the parallel magnet's cold current ratings. All parallel magnet circuits must have the same voltage rating.

When applying the control's magnet temperature monitor features with multiple magnets, care must be taken to properly configure the drive parameters for cold resistance.

Q: Can the MagnePulse DMC be applied on AC sourced cranes?

A: Yes, Magnetek or the customer can provide a rectifier to source DC voltage to the control.

Q: Are circuit breakers required for MagnePulse DMC protection?

A: No, MagnePulse DMC pre-engineered panels come standard with fuses for branch circuit protection and the control has a built-in DC bus fuse for semiconductor protection. Main and Control circuit breakers are optional equipment to provide disconnects at the magnet control. Control and circuit breaker may be optionally added to pre-engineered panels.

Q: Does the MagnePulse DMC interface with IMPULSE®•Link 4.1?

A: Yes, all features of IMPULSE•Link 4.1 Basic and WDS are functional for the MagnePulse DMC.

Q: How does the MagnePulse DMC determine the magnet's core temperature?

A: In order to accurately determine the magnet's core temperature the control must be programmed with the drive's cold (25°C) resistance. The control can then measure the steady-state voltage and current of the magnet while operating to determine its hot resistance. Using the change in resistance the control can then estimate the temperature rise.

Q: Is a dedicated braking transistor and resistor required if the power supply can handle regenerative energy?

A: Yes, because the MagnePulse DMC opens a main line contactor during fault conditions, removing the power supply from the DC bus. This causes the magnet's energy to regenerate back to the control's DC bus; if that energy were unregulated, control damage could occur.

Please contact Magnetek Material Handling with any additional questions.

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