

Hubbell Industrial Controls, Inc.

Type 4272-CAT E-Mag Magnet Controller Automatic Discharge - For Use with 24 VDC Generator Field

Catalog • February 2011

— **NEW PRODUCT RELEASE** —



hubbell industrial controls, inc.

The Hubbell Type 4272-CAT Solid State Magnet Controller is for use with DC Generators utilizing 24 VDC Fields. It can be used with all types and makes of lifting magnets. It assures fast and clean release of all type of magnet loads.

All or part of the load may be dribbled if desired. In addition, the magnet and magnet leads are not subjected to high induced voltages. Also, ground fault protection is included as a standard feature.

Standard Features

- 24 V.DC Input
- Automatically discharges magnet
- Compact size makes installation simple; requires only a few control wires
- No moving parts to replace; 100% solid state
- Replacement parts are plug and play
- Rated for 100% Duty Cycle
- Generator speed independent (-20%/+40%)
- Dynamic Field Controller with Closed Loop for fast response
- No external relays, transformers or control devices required for installation
- Works with existing push button
- Reduces Generator Brush wear with Electronic Lift/ Drop Switching
- Soft field charge increases magnet life
- Increased fuel efficiency of the primary mover
- Nema Type 4 enclosed
- Over Current Protection
- Output for remote Voltmeter
- Output for remote Ammeter
- OEM Connections

Application

Hubbell Type 4272-CAT Lifting Magnet Controllers have many uses from light or heavy scrap handling to extremely heavy plate or billet handling utilizing generator field control. The flexibility of this magnet controller is illustrated by the ease of proper “cleaning” that can be accomplished when switching from one type of material to another. 90% of all material will release correctly on the standard magnet setting. A simple adjustment of the potentiometer (P1) is all that is required to allow for use with slabs and other large ferrous pieces. This also makes this the perfect controller for drop ball work.

An inherent dribble characteristic is designed into each unit allowing sorting of light to heavy material. This is accomplished by holding the lift pushbutton then applying the drop switch until the desired material releases. Simply release the lift pushbutton and the application of the drop button returns to normal operation.

Description

The Hubbell Type 4272-CAT Magnet Controller incorporates solid state components arranged to provide a new concept in magnet controller design and operation with over four years of testing and field applications in generator field control. Hubbell again leads the magnet controller industry with the latest technology.

Type 4272-CAT Magnet Controllers include all necessary power and reverse current connections. Discharge path is electronically controlled without use of power resistors or varistors. There is no need for contactors to carry the power to the magnet. The reverse current or “Drop” cycle is controlled by a dynamic closed loop system that uses PLC Logic. The PLC algorithm compares the magnet voltage, generator speed, and shunt field voltage. It always knows the generator speed, field voltage, direction of the field, and magnet voltage. This gives very fast lift times and accurate dropping or dribbling the load. This cycles the magnet with little delay from Lift to Drop. Most non-Hubbell field controllers have a long delay between lift and drop because they use a stepped-field control or open loop system, utilizing plug in relays. The e-mag controller quickly discharges the magnet energy through the generator “shaft”. Again, requiring no relays or external resistors.

Since the Generator absorbs the highly inductive magnet load, the e-mag is rated at 100% duty cycle. We are not limited on contactor size rating, resistor, or varistor ampacity. Because we electronically ramp up and down the charge and discharge voltages, the voltage is “smoothly and quickly” applied to the magnet for soft field charging. Typical previous technology “shocks” the magnet coil causing an internal shift of coil. The e-mag with the dynamic loop system smoothly charges and discharges the magnet which eliminates shocking and increases magnet life. The maximum voltage permitted by the e-mag is between 275-325 volts depending on generator speed. This feature assures extra protection of the magnet and cable system insulation.

Typical Installation

Typical installation plugs into existing wiring harness using OEM Connectors.

Generator field connections @ load dependant min. capacity (F1 and F2) (2 wires).

Generator armature connections @ load dependant min capacity (A1 and A2) (2 wires).

Magnet connections @ load dependant min. capacity (M1 and M2) (2 wires),

The quick set up and makes controller installation easy and allows quick retrofit of existing controllers.

Operating Characteristics

The Hubbell e-mag controller is a SCR (PWM) generator field controller. The 24 VDC input is converted with SCRs control. The acute phase angle allows smooth charging of the magnet. The 24VDC is pulse fired which dynamically controls the field during both lift and drop modes. Voltage feedback from the Magnet allows quick boost voltages which allow pick time and drop time to be accelerated. Generator speed, magnet voltage and field voltage are compared by the PLC, which produces a PID loop that controls the magnet to run in a closed loop system. This also allows large swings of generator RPM without affecting the magnet characteristics or magnet controller operation. Plus 40% and Minus 20% are allowed during generator loading of the magnet. Prior to "e-mag", it had to be within 3% of generator running rpm.

Options

- Type 304 Stainless Steel Enclosure
- Remote Mounted Voltmeter and Ammeter
- Diagnostic and Field Set Up Controller
- Consult factory for additional options



Programmable Logic Controller

Available Sizes

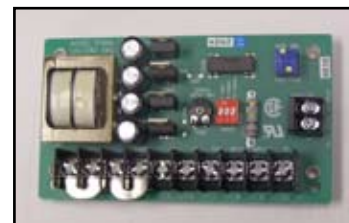
Factory Configurations for 24 Volt Generators			
Applicable Machine	KW Rating	Rated Amps	Catalog Number
M318	10	43.5	4272-10-24-4-CAT
320B M320 325B M325B	15	65.2	4272-15-24-4-CAT
325 M325B W330B 330B	20	87.0	4272-20-24-4-CAT
345B W345B 350	25	108.7	4272-25-24-4-CAT
375 RMH 345 RMH 5080	33	143.5	4272-33-24-4-CAT
375	40	173.9	4272-40-24-4-CAT

Dimensions & Weight

Units:	5kw - 20kw	25kw - 40kw
Width	16"	16"
Height	16"	20"
Depth	6"	8"
Weight	30 lbs	40 lbs

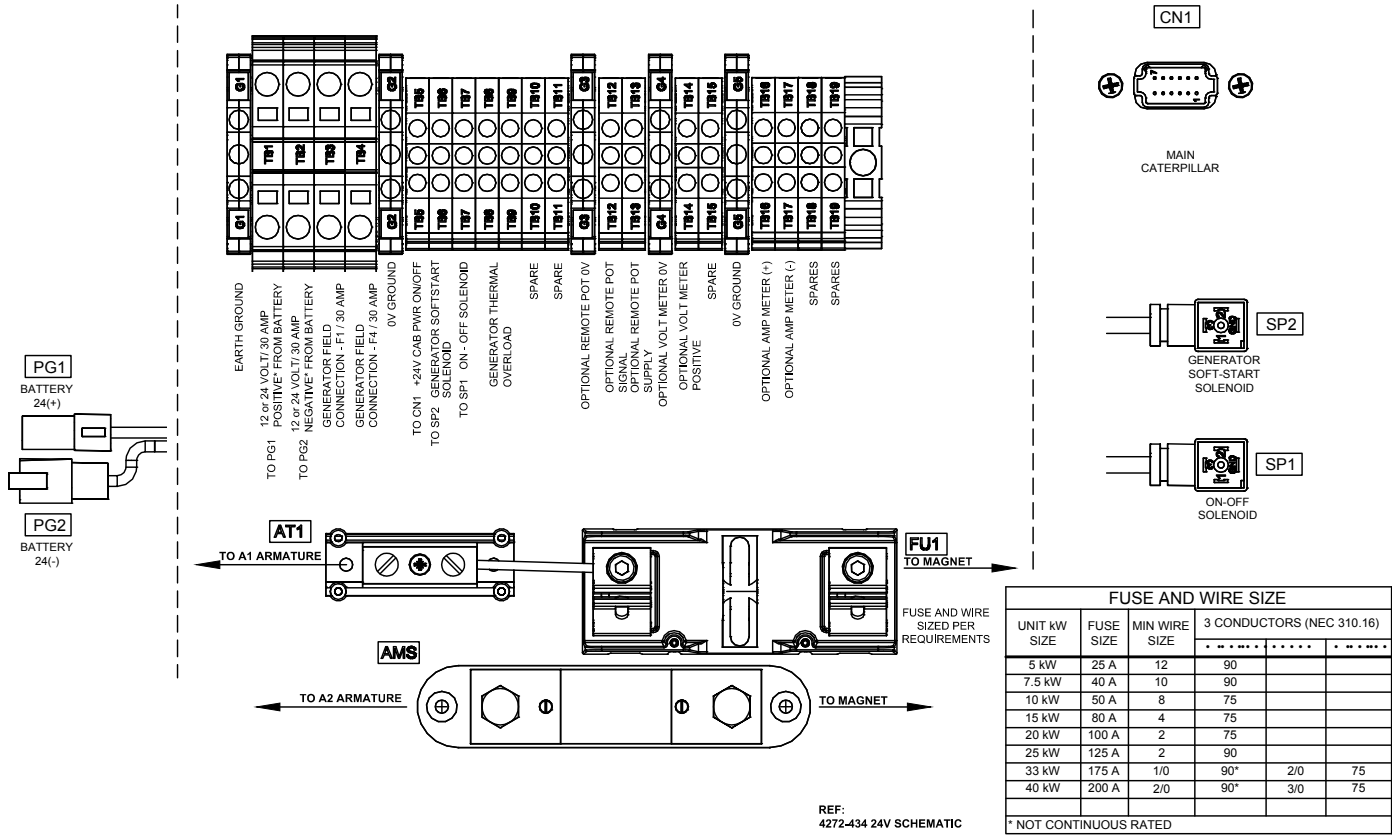


DC Driver Board



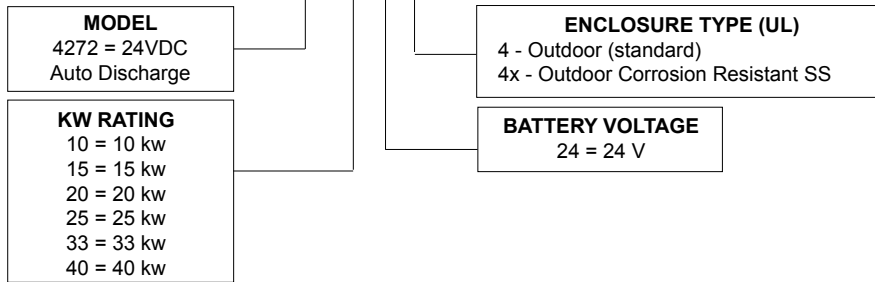
Process Control Board

Type 4272-CAT Customer Connections



Ordering Information:

EXAMPLE CATALOG NUMBER: **4272-15-24-4-CAT**



Example: 4272-15-24-4-CAT

4272-CAT E-Mag automatic discharge magnet controller, 24 volt for a 15 kw generator with a 24 volt battery power source, and housed in a standard NEMA type 4 wall mounting enclosure



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