Kinetics Industries, Inc.

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Kinetics manufacturer of:

Rectifiers & DC Power Supplies 1-2000 Kw
For
Material Handling Applications

Rectifiers & Power Supplies For:

- *Cranes – Plant Floor Mounted Power*
- *Cranes – On Crane Mounted Power*
- *Heavy Lift Magnets*
- *Controlled Magnetic Flux Power Supplies*
- *Magnetic Brakes & Chucks*
- *Separation Magnets*
- *Elevators*
- *Mill DC Power Distribution*

Constant Potential & SCR Regulated Output Systems

Since 1939 – A Made In USA Owned & Operated Company

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Kinetics Material Handling Power Systems
Rectifiers & Power Supplies 1 to 2000 Kw

Kinetics manufactures a *family* of rectifiers and power supplies for material handling applications that matches the unit design to the application performance or environmental demands. Kinetics offers the widest product line of crane and magnetic application rectifiers on the market today. Kinetics' in-house capacity for metal fabrication and transformer manufacturing, in the 1 to 2000 KVA range, combined with over 50 years of manufacturing experience for crane & magnetic applications, empowers Kinetics to supply the customer with the "best" solution design and optimal features for a given material handling application.

This guide is divided into three areas to assist in selection of the optimal rectifier or power supply for a given application:

1. Alphabetical listing of Kinetics model types and a brief description for each product.
2. Alphabetical listing of Kinetics model types with a functional description of each model and application design features available.
3. Selection guide by application. Model types of rectifiers and power supplies commonly associated or designed for a given material handling application

Alphabetical Listing of Product Model Types

Brakes:

BPP: Kinetics' flux forcing brake power supply. Dual voltage power supply and Associated timing circuitry for charge to hold

Crane Power

CVR: Constant voltage diode rectifier, "traditional" mill bus line regulated power supply 1 to 2000 Kw

Crane Power

CVR-CR: Crane mounted constant voltage diode rectifier for "high" vibration and "high" operating ambients . 1 to 2000 Kw. DC voltages 250, 300, 320 and 360 VDC

Crane Power

CVR-Rack: Open frame, constant voltage rectifier for mounting within a crane span center, rooms defined as an enclosure or an enclosure by "other"

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Magnet Power
JVR: Fuseless, bolted fault rated constant voltage diode rectifier for application where shorting of the DC output bus is probable. 1 to 2000 Kw
The world's #1 selling magnet rectifier.

Magnet Power
JVR-FF: Magnet *FLUX FORCING, BOLTED FAULT RATED*, fuseless, high production constant voltage rectifier specifically designed for Accelerated magnet charge and deduced voltage for load carry to maximize a scrap lifting magnet lifting capacity and operating cycle.

Magnet Power
JVRR: Fuseless, dual voltage output, magnet application, constant voltage rectifier, configured for reduced voltage picking of load and high voltage for magnet load carry.

General Crane or Magnet Power
MVR: 1 to 15 Kw, constant voltage diode rectifier for general mill duty application Diodes are fused

Crane Power
RGA: Regenerative absorption protection circuit for protection of the rectifier and the DC bus from over-voltage due to DC motors being driven by over-hauling loads commonly found on cranes, elevators and high inertia type loads such as machine tools.

Crane Power
SVR: +/-1%, 0 to 100% volts adjustment with full current capacity from 80 to 110% volts, SCR regulated rectifier for general heavy industrial applications

Magnet Power
SVRJ: Fuseless, +/-1, 0 to 100% voltage adjustment with current capacity from 80 to 110% volts, SCR regulated rectifier for applications where shorting of the DC bus is probable

Magnet Power
SVRJ-SAP: Select-A-Pick, fuseless SCR regulated rectifier, +/1% from 0 to 110% voltage, for variable magnet loading and unload via various operational control mode methods such as operation selection switch or remote control signal input

Separation Magnet Power
WVR: Separation magnet diode power supply for waste and bulk material flow magnet systems.

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Why is there a need for different types of magnet and crane power supplies?

The introduction and acceptance of AC control for many of the cranes motions has changed the desired functions of rectifiers for crane and magnet control. We have worked to listen to our customers towards developing a line of crane and magnet rectifiers to meet the productivity demand of our customers. Kinetics is proud to offer the widest range of product solutions for crane and magnet rectifier specific application, production parameters, environment of operation or budget constraint.

CVR: The model type CVR is a floor or motor room mounted heavy duty, industrial, constant voltage diode rectifier to supply line regulated DC power for general DC loads in the 15 to 2000 Kw capacity range. All CVR units include an isolation transformer, full wave diode bridge with diode fusing, AC and DC surge suppression, bleed resistance, fuse monitoring and a DC ammeter and voltmeter. Units can be supplied in either NEMA1, 2, 3R, 4, 4X or 12 enclosures. Units with inputs under 600 VAC come standard with an AC thermal magnetic circuit breaker and shunt trip. For applications up to 15 KV Kinetics offers optional types of AC switchgear in match and line up configurations. Kinetics' time proven, superior design, concept of convection and convection aided cooling designs provide the highest energy efficiency operation and lowest maintenance requirement on the market.

BPP: The model type BPP is solid state forced field "change" and reduced voltage for "hold" energy efficient magnetic brake diode power supply. The BPP system includes a dual voltage transformer configuration and circuitry for flux forcing of brake magnet charge and automatic voltage "drop back" for brake coil hold voltage. The BPP system eliminates the need for energy wasting DC voltage dropping resistors. Standard systems are available for the "major" brakes on the market. Custom systems are also available. Units can be supplied as open panels, mounted in NEMA1 or 12 enclosures or multiple BPP panels in a common enclosure assembly.

CVR-CR: The model type CVR-CR is a constant voltage, line regulated, diode rectifier, specifically designed for the harsh operating environment and vibrations commonly encountered on mill bridge cranes. CVR-CR system includes, extra heavy structural design features and vibration absorbing component to insure maximum product life. System components are selected and designed for the higher operating ambients, 50 to 60 degrees C, commonly found in closed roof building and operation above "hot" manufacturing processes. Standard systems include an AC molded case circuit breaker with shunt trip, isolation dry type transformer, full wave diode bridge with diode fusing, AC & DC surge suppression, bleed resistance, annunciation package and a fused 250 VDC control power source for customer use. Common DC output voltages available are 250, 300, 320 and 360 VDC. DC output motor fusing is an available option. An aggressive effort is made in the heavy-duty enclosure design to be as space conscience as possible without compromising performance or serviceability.

CVR-RACK: The Kinetics model type CVR-RACK is a special purpose adaptation rectifier of the CVR-CR crane mounted constant voltage diode rectifier. The CVR-RACK is supplied without an enclosure and is mounted internal to the crane with an enclosed motor onboard. The open "rack" design provides the benefit of reduced size and weight. Systems include a molded case thermal magnet circuit breaker with shunt trip, isolation dry type transformer, full wave diode bridge, diode fusing, AC and DC surge suppression, bleed resistance, annunciation package and a fused 250 VDC control power source for customer use. Common DC output voltages are 250, 300, 320 and 360 VDC. DC output motor fusing is an available option.

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JVR: The Kinetics model type JVR fuseless and bolted fault rated magnet rectifier is the world's best selling magnet power supply. The JVR was specifically designed for magnet applications where shorting of the DC bus is common from cut cables or shorted magnets in scrap magnet applications. In the event of a fault on the DC bus, the JVR's AC circuit break is tripped. After the fault has been cleared the JVR's breaker can be reset and production is resumed without the cost of blown fuses or lost time of located and replacing fusing. Units are available from 1 to 500 Kw. Systems include and AC circuit breaker, isolation transformer, AC and DC surge suppression and bleed resistance. Available enclosures include NEMA1, 3R, 4, 4X, 12 and open panel for crane motor room mounting. Common adder features of DC ammeter & voltmeter and an AC main line contactor for remote on / off are available.

JVR-FF: The Kinetics model type JVR-FF combines the renowned benefit of Kinetics' JVR fuseless magnet rectifier with an automatic voltage switching system for a "high voltage", flux forcing, accelerated magnet charge and reduced voltage to a safe load "holding voltage" for load transport. The JVR-FF system eliminates the need for energy wasting dropping resistance used in conventional, accelerated magnet charge, power supply systems. The JVR-FF incorporates the use of a specialty, Kinetics manufactured, dual voltage, "bolted fault rated", tapped transformer, solid state timing circuit, and system protection features. All units are designed and manufactured for operation in the extremely harsh environments common to mill and scrap handling applications. Available options include DC ammeter & voltmeter, AC main line contactor for remote on / off. Unit comes standard in a NEMA3R indoor / outdoor enclosure. Options of NEMA12, 4 and 4X enclosures are available. Nameplate or operating parameters of the magnet(s) is required for JVR-FF rectifier specification and a unit proposal.

JVRR: The Kinetics model type JVRR is a "reverse" mode operation of Kinetics' model type JVR-FF. The operational control scheme is for the fuseless rectifier to "charge" the magnet at a set "reduced" voltage and automatically switch to a set "high" carry voltage. The "switching" to the maximum rectifier output voltage, can be activated by either a solid state timer, an interface contact with the crane control travel motions or a remotely supplied control signal. The JVRR has optional features of a DC ammeter & voltmeter, AC line contactor and enclosure types NEMA12, 4 and 4X. Nameplate or operating parameters of the magnet(s) is required for JVRR rectifier specification and a unit proposal.

MVR: The model type MVR is a "traditional" NEMA specification, general purpose, constant potential, fused diode rectifier in the 1 to 15 Kw capacity range. This work horse, heavy industry, power supplies includes: an input molded case thermal magnetic circuit breaker, isolation dry type transformer with six 5% taps for voltage adjustment, primary of diodes fusing, full wave diode bridge, AC and DC surge suppression, DC bleed resistance, DC ammeter & voltmeter and a NEMA3R base or floor mounted enclosure. Common optional features include: AC main line contactor, DC undervoltage and / or undercurrent relay, regenerative absorption protection (RGA) and DC output circuit breakers. Enclosure options include open panel construction, NEMA 4, 4X, 12 or wall mounted enclosure.

RGA: The Kinetics model type RGA is a regenerative absorption circuit is a DC bus power protection circuit for applications where overhaul loads will result in DC motors regenerating mechanical power into electrical power back onto the DC bus. Applications such as cranes, elevators, rotational machine tools are common examples where regenerative absorption capacity must be to the rectifier system. A diode or SCR rectifier is a "one way" system and will not permit power to pass back into the AC service, thus when a DC motor is in a regenerative mode of operation the DC bus voltage rises. If the energy is not dissipated damage can result to

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rectifier or "other" load items on the DC bus. A Kinetics regeneration circuit an application proven, dependable, self contained, DC circuit connected to the DC bus. The DC bus voltage is monitored and when the DC us voltage exceeds a thresh hold set point, a heavy industrial mill duty contactor applies resistance to bleed off the regenerative power and return the bus voltage to the nominal value. NEMA recommends, as a general application guide line, a regenerative capacity of 10% of the rectifier kilowatt capacity. Some applications, such as hot metal crane or elevators require greater then a 10% capacity, each application should be reviewed with Kinetics' sales engineering for proper RGA capacity selection.

SVR: The Kinetics model type SVR is a heavy industrial, general purpose, limited operating range, SCR regulated voltage rectifier in the 1 to 2000 Kw capacity range. Units are designed for providing a stabilized DC bus voltage with full rated current capacity from 110% to 80% of rated voltage. Applications with parallel rectifiers or MG sets on a common bus can operate in a master – slave combination, for controlled load sharing or distribution between paralleled rectification units. Units include as standard: AC molded case circuit breaker (600 volts and lower), isolation dry type transformer, hybrid or SCR full wave bridge rectifier, AC & DC surge suppression, bleed resistance, high duty logic circuitry for SCR firing and system protection, annunciation package including a DC ammeter and voltmeter and NEMA3R enclosure. Units are available for inputs up to 15 Kv and Kinetics offers AC and DC switchgear as an available. Enclosure options include NEMA 4, 4X, 12 and wall mounting. Numerous control and annunciation options are available upon request from Kinetics sales engineering.

SVRJ: The Kinetics model type SVRJ is a fuseless +/-1% voltage or current regulated rectifier designed for crane or magnet applications where shorting of the DC bus is probable. Output voltage is adjustable from 0 to 100% and full current capacity from 110% to 80% volts. Below 80% volts current capacity is reduced directly proportional with voltage. Output can be adjusted by a control potentiometer, a customer supplied 4 – 20 milliamp signal or 0 to 10 VDC signal. Systems are suitable for mill floor or crane mounting. SVRJ features include an AC molded case circuit breaker, isolation dry type transformer, fuseless full wave SCR bridge and associated solid state SCR regulator circuitry, heavy duty AC and DC surge suppression, output bleed resistance, annunciation and system protection package and a heavy mill duty NEMA 3R enclosure. Enclosure options include NEMA 4, 4X, 12 and wall mounting. Numerous control and annunciation options are available upon request from Kinetics' sales engineering.

SVRJ-SAP: The Kinetics model type SVRJ-SAP combines the Kinetics' specialty magnet power supply features of fuseless design, flux forcing for accelerated magnet charging and SCR regulated control for controlled magnet lifting force and controlled drop or discharge, into one high productivity magnet power supply system. The ***SVRJ-SAP*** enables a crane operator to efficiently select the quantity of material to be lifted and release / drop the desired amount from a given magnet load. The ***SVRJ SAP Select-A-Pick*** regulated voltage output can be supplied for either control pendant operation and a multi-position selection switch or a remotely supplied 4 – 20 milliamp or 0 to 10 volt control signal. Pendant selector switch control is available for 2 to 12 positions. Remote signal inputs systems provide an infinitely variable combination for loading and unloading. Units are available from 1 to 300 Kw. The ***Select-A-Pick SVRJ-SAP*** is ideally suited for finished product handling for warehousing and transportation loading facilities. The regulation and control feedback logic within the Kinetics' SVR-SAP system provides uniform operation from the handling of "small" rod or pipe stock to multiple heavy plates.

WVR: The model type WVR is a diode power supply designed specifically for separator or separation magnet applications. WVR units are designed for continuous operation at a fixed load. Systems include an AC

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contactor with thermal overloads, isolation dry type transformer, full wave diode bridge, semi-conductor fusing, AC & DC surge suppression and a NEMA 3R wall mounted enclosure. Enclosure options include NEMA 4, 4X, 9 and 12. Capacity 1 to 500 Kw. Three phase AC input voltages available 600, 575, 480, 460, 440, 380, 240, 220 and120. Single or three phase and 60 or 50 Hz. DC outputs of 500, 250, 240, 230, 125, 120 and 115. Other common options available are, loss of DC volts or amps trip relays, DC ammeter and voltmeter, DC circuit breaker and fault warning horn.

Product Application Guide
Material Handling Rectifiers & Power Supplies

Motor Room or Floor Mounted: Crane & Misc. Loads:

- **MVR with RGA:** 1 to 15 Kw diode power supply, line regulated with regenerative absorption circuit.
- **CVR with RGA:** 15 to 2000 Kw diode power supply, line regulated with regenerative absorption circuit.
- **JVR with RGA:** 1 to 2000 Kw, fuseless, diode power supply with regenerative absorption circuit for applications where faults / shorting of the DC bus is probable.
- **SVR with RGA:** 1 to 2000 Kw, SCR rectifier, stabilized output, +/-1% output regulation with regenerative absorption circuit
- **RGA:** Regenerative absorption protection circuit applied to the DC bus to dissipate the power generated by overhauling loads, common to cranes, elevators and machine tool applications. *The crane motor control scheme should be reviewed and evaluated for the potential requirement of regenerative protection in addition to the crane control dynamic braking resistance.*

Crane Mounted Rectifiers:

- **BPP:** Magnetic crane brake power supply via flux forcing control scheme.
- **CVR-CR:** 15 to 2000 Kw, diode power supply, crane motor service factor & "higher" operating ambient design. Construction to fix available crane spacing and withstand crane vibrations.
- **CVR-RACK:** 1 to 2000 Kw, diode power supply, constructed in an open assembly for mounting within a crane center ambient controlled environment. Contracted to withstand crane movement vibrations.
- **SVR-CR:** 1 to 2000 Kw, SCR regulated rectifier, +/-1% output voltage regulation, responsive to AC line variations or 0 to 100% DC loading variations. Unit designed and contracted to match motor service motors and "higher" operating ambient and crane movement vibrations common to heavy industrial cranes.
- **RGA:** Regenerative absorption circuit for absorption of regenerated power from overhauling loads. *The crane motor control scheme should be reviewed and evaluated for the potential requirement of regenerative protection in addition to the crane control dynamic braking resistance.*

Magnet Power Supplies Plant Floor Mounted:

- **JVR:** Fuseless, diode, power supply for magnet load(s) 1 to 2000 Kw.
  Highly recommended for scrap / heavy lift applications
  The world's #1 selling magnet power supply!
- **JVR-RGA:** Fuseless, diode, power supply with a regenerative absorption circuit; for applications where shorting of the DC bus is probable and also include loads with overhauling potential.
- **BPP:** Magnetic brake, flux forcing, diode power supply.

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- **MVR:** "Traditional" NEMA specification diode power supply with diode fusing 1 to 15 Kw.
- **CVR:** "Traditional" NEMA specification, diode power supply with diode fusing 15 to 2000 Kw.
  A regenerative absorption protection circuit may be required if the load includes DC motors with overhauling potential. Common sizing, 10% of the rectifier capacity

- **SVRJ:** *Fuseless, SCR regulated rectifier, +/-1% output regulation, DC output adjustment from 0 to 100% via control potentiometer or remote input signal. Available 1 to 2000 Kw.*
- ***WVR:*** *Separation magnet power supply for waste or bulk material flow systems.*

Magnet Power Supplies Crane Mounted:

- ***JVR:*** *Fuseless, diode, power supply, for magnet load(s) 1 to 2000 Kw.*
  Highly recommended for scrap / heavy lift applications.
  The world's #1 selling magnet power supply.
- ***JVR-FF:*** *Flux forcing , fuseless, magnet power supply, accelerated magnet "charge" time and automatic reduced voltage for load "carry". Unit maximizes lift capacity and reduces magnet charge time for maximum lifting cycles.*
- ***JVR-OP:*** *Fuseless, diode, power supply in an open panel assembly for mounting within an enclosure supplied by other or with an environmentally controlled crane center. Suitable for high vibration operating environments common to crane mountings. Units 1 to 10 Kw supplied with transformer mounted to the "panel". Above 10 Kw, the transformer is supplied as a base mounted unit with terminal board connections for installer use.*
- ***JVRR:*** *Fuseless, diode, power supply with "reduced" voltage for magnet "charge" (Controlled load pick) and switches to a maximum "higher / hold" voltage for "carry" of magnet load.*
- ***JVR-RGA:*** *Fuseless, diode power supply with a regenerative absorption circuit for overhauling loads. Ideal for applications with both a scrap magnet and crane motors on the same bus.*
- ***MVR:*** *"Traditional", NEMA specification , diode power supply with fused diodes. 1 to 15 Kw.*
- ***SVRJ-CR:*** *Fuseless, SCR regulated rectifier +/-1% output regulation, 0 to 100% output adjustment via control potentiometer or remotely supplied signal. Designed for "higher" ambient temperatures common found on crane applications.*
- ***SVR-SAP:*** Select-A-Pick, *fuseless, SCR regulated rectifier with solid state control scheme for regulated flux control of a lifting magnet. System provides "selected" lifting capacity and controlled magnet load "dropping" via a rotary control switch, infinitely variable potentiometer or customer supplied control signal.* Ideally suited for automated finished product handling, inventorying and shipping facilities.

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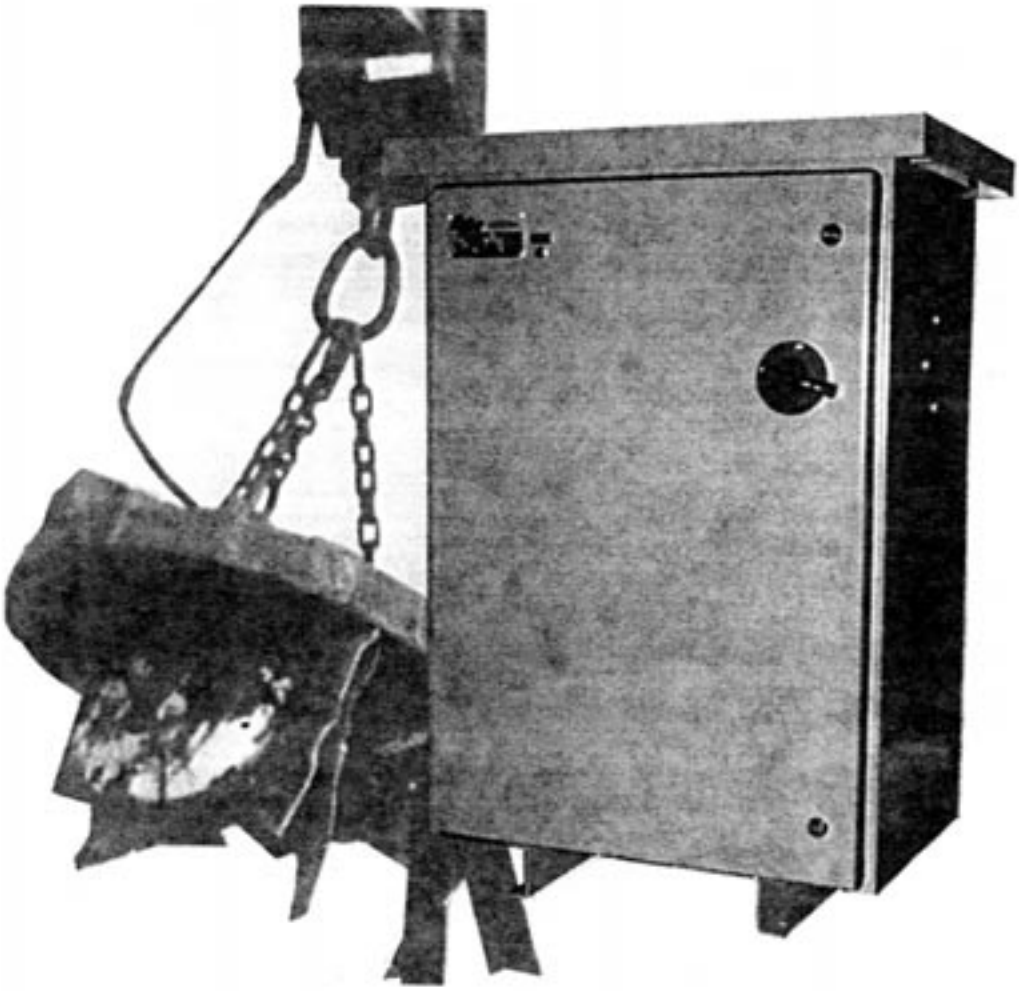

Other Kinetics manufactured products:

- *Synchronous Motor Field Exciters*
- *KinetSync-SR: Brush Type Synchronous Motor Controller*
- *KinetSync-NB: Brushless Type Synchronous Motor Controller*
- *Motor Field Application Panels*
- *Generator Field Excitation Systems*
- *Traction Duty DC-AC Motor Alternator Sets*
- *Traction Rectifiers*
- *Dry Type Transformer 1 to 2,500 KVA*
- *Hanger Support – Avionics - 28.5 VDC Rectifiers*

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