

LINE REACTOR

KDR



Prevents Nuisance Tripping

- Limits expensive down-time

Reduces harmonic current

- Increases life of drive
- Protects sensitive equipment

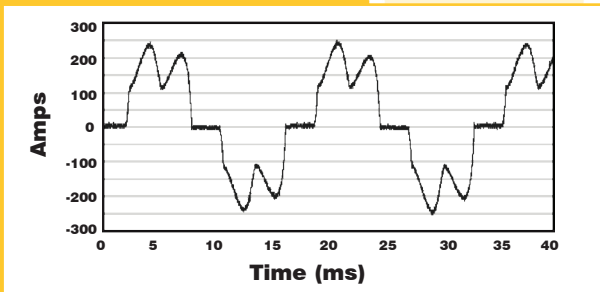


Line Reactors • Harmonic Filters • EMC Filters • dv/dt Filters • Sinewave Filters

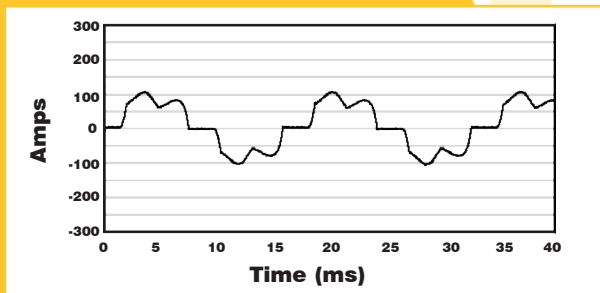
LINE REACTOR

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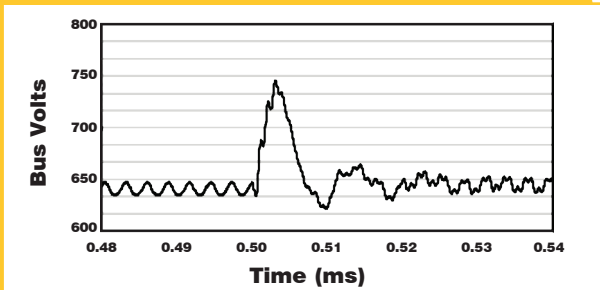
Harmonic Current Distortion Without KDR



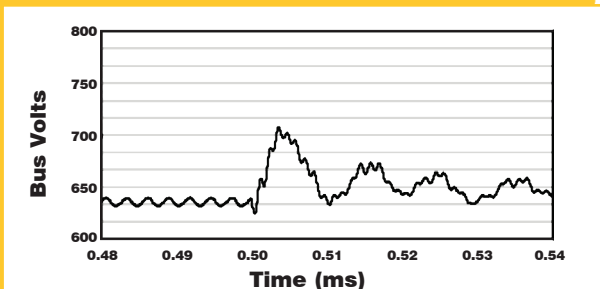
Harmonic Current Distortion With KDR



Transient voltage without KDR



Transient voltage with KDR



Typical Problems, Superior Solutions with KDR

Power quality has degraded over time due to the increased use of non-linear loads. Drives and other sensitive devices are vulnerable to electrical distortion on the line.

Harmonics and Power Quality

Variable frequency drives are beneficial to a wide range of applications, but contain a power conversion process that creates current and voltage distortion which can cause system-wide problems, including:

- Transformer and distribution equipment overheating
- Random breaker tripping
- Sensitive equipment may fail completely
- Poor power factor
- Reduced system efficiency

KDR Optimized Line Reactor on Harmonics

The addition of a KDR Reactor will reduce harmonic content, which reduces the total RMS current, thereby improving the total power factor.

- Nuisance tripping is less common
- Drive uptime is increased
- Power factor is improved

Transient Voltages cause Nuisance Tripping

A voltage transient, commonly caused by capacitor bank switching (or other issues), sends a current surge into the VFD bus capacitor. The additional current raises bus voltage, thus causing a drive fault (trip). In addition, this overvoltage condition will cause the drive to shut down in order to protect its components.

KDR Optimized Line Reactor on Transient Voltages

The additional impedance offered by the KDR Line Reactor slows down the current surge, thus reducing the likelihood of the drive tripping offline.

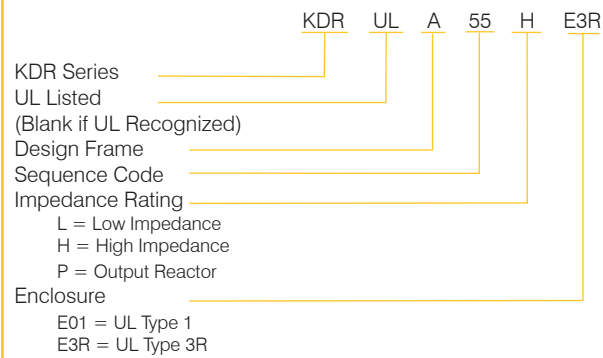
Unbalanced Distribution Systems cause Nuisance Tripping

Input voltage phase unbalance may prevent the drive from performing due to subsequent overcurrent conditions which cause the drive to cease operating.

KDR Optimized Line Reactor on Unbalanced systems

The addition of a KDR Reactor to the input of every drive will help balance the drive input line currents.

Part Numbering System



Impedance Options

The KDR Optimized Drive Reactors have been designed to provide the best protection for both your drive and your application. KDR Optimized Drive Reactors are available in two ratings versions, Low “Z” (low impedance) and High “Z” (high impedance). Input impedance can significantly improve drive performance. Select impedance based on the guidelines below:

Use KDR Low “Z” Units For:

Any application where either a 1.5% or 3% reactor would be applied.

Reduction of nuisance tripping caused by:

- Transient voltages caused by capacitor switching
- Line notching
- DC bus overvoltage tripping
- Inverter overcurrent and overvoltage

Additional benefits include:

- Lowering injected percentage of harmonic current
- Improving true power factor
- Reducing cross-talk between drives
- Adding impedance to drives with DC link chokes/ reactors when more impedance is desired due to a relatively stiff source

Use KDR High “Z” Units For:

Any application where a 5% reactor would be applied.

KDR High “Z” offers the same superior benefits as Low “Z” plus additional benefits which include:

- Helping prevent drive component damage
- Providing maximum harmonic mitigation without adding capacitance
- Further improving true power factor
- Adding impedance to drives without DC link chokes/ reactors when more impedance is desired due to a relatively stiff source

Product Specifications

- Impedance Protection: Low “Z” and High “Z”
- System Voltage: 208/240 VAC, 480 VAC, 575/600 VAC, 690 VAC
- Ambient Temperature: 50° C (122° F) - Open; 40° C (104° F) - Enclosed
- Altitude (Maximum): 2,000 meters (6,000 feet)
Derating necessary above 2,000 meters
- Fundamental Frequency: 50/60 Hz
- Short Term Overload Rating: Tolerate 200% rated I for a minimum of 3 minutes
- Agency Approvals: cUL, UL;
UL Recognized, CE Marked
- Inductance Characteristics:
Minimum 95% L at 110% Load
Minimum 80% L at 150% Load
- Input and Output: Available for either the line or load side of a VFD
- Enclosures: Open, UL Type 1, UL Type 3R
- DIN Rail version available: see web site for details

KDR extends the life of the motor on the output of the VFD:

- Dampen Overshoot Peak Voltage
- Reduce Motor Heating
- Reduce Audible Noise



Reliable  Advanced Power Quality

KDR Typical Applications

- Oil and Gas Pumps
- Irrigation Fields, Farms
- Water, Wastewater
- HVAC
- Steel Industry
- Pulp/Paper
- Machining
- Extruders

Additional Power Quality Solutions:



HG7 Passive Harmonic Filter

- Helps meet IEEE-519
- Reduces harmonic distortion to less than 7% TDD at full load
- Improves power factor



H5 Active Harmonic Filter

- Helps meet IEEE-519
- Reduces harmonic distortion to less than 5% TDD at full load
- Actively monitors the load current while returning the power factor to near unity



KRF EMI/RFI Filter

- Filter EMI/RFI noise caused by power switching devices
- Meet FCC regulation 15, subpart 3
- Prevents interference with automated lighting circuits, security cameras, and other critical electronics



V1k Motor Protection Output Filter

- Protects the motor and cable from voltage spikes due to high dv/dt and excessive cable capacitance
- Helps stop motor insulation breakdown
- Protects cable runs (up to 3,000 feet) and reduces motor heating, noise and vibration



KMG Motor Protection Output Filter

- Protects the motor by converting the PWM waveform into a near sinusoidal wave
- Prevents voltage overshoots that cause early degradation of insulation systems in motors, transformers, and cables
- Extends motor life by reducing operating temperature

Part Number: 23320 Version 1.3

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