







## General Safety Instructions

	Be sure to read, understand, and follow all safety instructions.
	Only qualified electricians should carry out all electrical installation and maintenance work on V1K drive output filters.
	All wiring must be in accordance with the National Electrical Code (NEC) and/or any other codes that apply to the installation site.
	Disconnect all power before working on the equipment. Do not attempt any work on a powered V1K output filter.
	The V1K, VFD, motor, and other connected equipment must be properly grounded.
	The VFD terminals and connected cables are at a dangerously high voltage when power is applied to the VFD, regardless of motor operation.

## Installation Checklist

- Access V1K installation drawings on the TCI website for unit dimensions, mounting hole pattern, mounting orientation, wire locations, unit weights, and other unit specific installation notes. <https://transcoil.com/products/v1k-motor-protection-filter/>
- Ensure installation location is not exposed to corrosive liquids or gases, explosive or combustible gases or dust, excessive airborne dirt and dust, or excessive vibration.
- Select mounting area that allows adequate cooling air and maintenance access.
- Ensure all wiring conforms to requirements of the National Electric Code (NEC) and/or other applicable electrical codes.
- Ground V1K output filter to a dedicated system ground to ensure safety and filter performance. Use properly sized grounding conductor.
- Wire output power terminals of the VFD to the input terminals of the V1K: U, V, & W.
- Wire the output power terminals of the V1K, T1, T2, & T3 to the motor power connections.
- Ensure VFD is set for operating modes and ranges that are compatible with the V1K.
- Check entire system thoroughly before energizing and operating any equipment.

When you receive the unit, immediately inspect the shipping container and report any damage to the shipping carrier who delivered the unit.

## Field Wiring Connection Terminals

Compression type terminals are available for all line wiring connections. The wire size capacity ranges and tightening torque for the reactor power terminals are listed in the table.

V1K Kit Part Num.	Current Rating	Reactor Terminal Block/ Optional Lug Kit Terminals		Board Part Num.	Lug Kit
		Wire Size	Torque (lb-in)		
V1K2A0K	2	12 - 14 AWG	10	25009	N/A
V1K3A0K	3	12 - 14 AWG	10	25009	N/A
V1K4A0K	4	12 - 14 AWG	10	25009	N/A
V1K6A0K	6	12 - 14 AWG	10	25009	N/A
V1K8A0K	8	12 - 14 AWG	10	25009	N/A
V1K12A0K	12	12 - 14 AWG	10	25009	N/A
V1K16A0K	16	4 - 12 AWG	20	25009	N/A
V1K18A0K	18	4 - 12 AWG	20	25009	N/A
V1K21A0K	21	4 - 12 AWG	20	25009	N/A
V1K25A0K	25	4 - 8 AWG	20	25009	N/A
V1K27A0K	27	4 - 8 AWG	20	25009	N/A
V1K35A0K	35	6 - 8 AWG	30	25011	N/A
V1K45A0K	45	6 AWG	30	25011	N/A
V1K55A0K	55	1 - 4 AWG	35	25011	N/A
V1K80A0K	80	1 - 3 AWG	35	25011	N/A
V1K110A0K	110	2/0 - 1/0 AWG	50	25011	SLK10
V1K130A0K	130	2/0 AWG	50	25011	SLK10
V1K160A0K	160	250 kcmil - 3/0 AWG	375	25012	SLK21
V1K200A0K	200	(2) 2/0 - 1 AWG	50	25012	SLK22
V1K250A0K	250	(2) 2/0 AWG	50	25012	SLK22
V1K305A0K	305	(2) 350 kcmil - 3/0 AWG	375	25012	SLK13
V1K362A0K	362	(2) 350 kcmil - 4/0 AWG	375	25012	SLK13
V1K420A0K	420	(2) 600 - 300 kcmil	500	25012	SLK14
V1K480A0K	480	(2) 600 - 350 kcmil	500	25012	SLK14
V1K600A0K	600	(2) 600 - 500 kcmil	500	25012	SLK14
V1K750A0K	750	(3) 600 - 400 kcmil	500	25012	SLK16

All electrical connections must be re-torqued annually.

See [www.transcoil.com](http://www.transcoil.com) for component drawings and dimensions. Please contact TCI Technical Support or your TCI distributor for application information regarding the use of V1K output filters on the output side of the VFD.



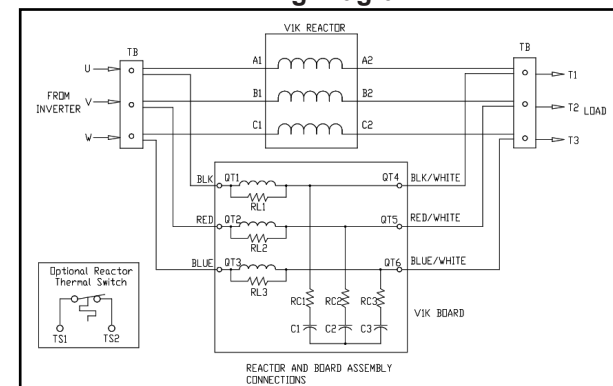
An Allied Motion Company

# V1K Kit Installation Guide

## Product Specifications

- Current Rating: 2 - 750 Amps, 208 V - 600 V, .75 - 600 HP
- UL Listed
- Efficiency > 98%
- Insulation Rating: 600V Class
- Insulation Class: Class H (180°C or better)
- Maximum Altitude: 2000 m (6,000 ft) Derating necessary above 2000 m
- Lead Length: up to 1,000 ft (Specific applications could reach longer lead lengths.)
- Ambient Temp: Min -25°C, Max 40°C
- For use with three phase VFDs operating at 2 kHz - 4 kHz PWM carrier frequency and with a maximum motor cable size necessary to achieve a 5% voltage drop at 1,000 ft.
- Optional thermal switch electrical rating: 120 V/6 A
  - Switch opens on temperature rise
  - 2 A to 12 A standard 195°C trip
  - 2 A to 12 A EX version 160°C trip
  - 16 A to 110 A 160°C trip

## Wiring Diagram



TCI, LLC  
W132 N10611 Grant Drive,  
Germantown, Wisconsin 53022  
800-824-8282 | [www.transcoil.com](http://www.transcoil.com)

TCI, LLC  
W132 N10611 Grant Drive,  
Germantown, Wisconsin 53022  
800-824-8282 | [www.transcoil.com](http://www.transcoil.com)

Revision 1.0

Part # 31259

06/06/2022

## Verify the Application

Ensure V1K is correct for the application. Current rating of the V1K should be sized to handle the FLA rating of the motor but not exceed 110% of the drive output current rating. This V1K is best applied matched closely to the load. The V1K is not selected by the drive input current rating. Properly sized and applied, TCI guarantees that the V1K will limit motor terminal peak input voltage to 150% of bus voltage with a wire lead length of 1,000 feet and a carrier frequency of 4kHz. Max lead length and carrier frequency can vary depending on wire lead type. For best performance, the V1K should be installed within 10 feet of the drive.

## Power Wiring

The conduit and wiring from the output of the VFD to the motor must be routed to the V1K and then to the motor. TCI recommends a separate dedicated conduit run for each drive/filter/motor run unless properly shielded and segregated wiring procedures are practiced. Parasitic and induced capacitance can greatly reduce the effectiveness of the filter. Under no circumstances should you wire both control and power wire in the same conduit unless the wireway is specifically designed for this practice. The line reactor temperature is sensitive to lead wire oversizing. Avoid lead wires more than five times oversized by copper cross sectional area regardless of the material used. Use 75°C copper conductors only or the equivalent, unless the wire connector is marked for Al/Cu, then the use of aluminum wire is permitted. Use only copper conductor on units rated above 80 amps.

## Grounding

The V1K filter must be connected to the ground of the premises wiring system. Connect the filter to a known ground nearby the filter or run a special ground wire dedicated for the application. The ground connection must be made using a wire conductor. Metallic conduit is not a suitable grounding conductor. The integrity of all ground connections should be periodically checked.

## Variable Frequency Drive Settings

Make sure that the VFD will be set for operation modes and ranges that are compatible with the V1K:

- **Maximum output frequency:** 60 Hz
- **PWM switching frequency:** 2 kHz and 4 kHz
- **Mode of operation:** Do not use filter on 600 VAC systems with Dynamic DC braking resistors or Active Front End drives
- Do not use on overhauling loads without bus voltage control.

## KDR Reactor Lug Kits

Follow NEC guidelines to determine acceptable wire ampacity requirements.

Lug Kit	Fig. Number	Lug Wire Range	For Lug Torque	Bolt Assembly Torque	See Website For Lug On Reactor Drawings
SLK10	1	2/0 - 14 AWG	See Table S2/0	66 lb-in (7.5 N-m)	See Drawing (LK10-DWG)
SLK13	2	(2) 350 kcmil - 6 AWG	See Table 2S350	450 lb-in (50.8 N-m)	See Drawing (LK13-DWG)
SLK14	2	(2) 600 kcmil - 4 AWG	See Table 2S600	450 lb-in (50.8 N-m)	See Drawing (LK14-DWG)
SLK16	3	(3) 600 kcmil - 2 AWG	See Table T3A2-600N	450 lb-in (50.8 N-m)	See Drawing (LK16-DWG)
SLK21	1	250 kcmil - 6 AWG	See Table S250	66 lb-in (7.5 N-m)	See Drawing (LK21-DWG)
SLK22	4	(2) 2/0 - 14 AWG	See Table S2/0	66 lb-in (7.5 N-m)	See Drawing (LK22-DWG)

## Lug Torque Tables

Table S2/0		IHI Connectors		
Wire Size Copper (solid to semi-rigid stranded and metric mm, ##)	Rating C	Wire Size FLEX Copper (#)	Wire Size Aluminum	Torque (all drive means)
N/A	90	1/0 - 1 AWG	N/A	75 lb-in (8.5 N-m)
N/A	90	1 - 4 AWG	N/A	55 lb-in (6.2 N-m)
2/0 - 3 AWG	90	4 - 8 AWG	2/0 - 3 AWG	50 lb-in (5.6 N-m)
4 - 6 AWG	90	8 - 10 AWG	4 - 6 AWG	45 lb-in (5.1 N-m)
8 AWG	90	10 - 14 AWG	8 AWG	40 lb-in (4.5 N-m)
10 - 14 AWG	90	N/A	10 - 12 AWG	35 lb-in (4.0 N-m)
Table S250		IHI Connectors		
250 kcmil-2 AWG	90	3/0-2 AWG; 70-50 mm <sup>2</sup>	250 kcmil - 2 AWG	375 lb-in (42.4 N-m)
(1),(2) 25-16 mm <sup>2</sup> (1) 35 mm <sup>2</sup>	90	2-6 AWG; 35-16 mm <sup>2</sup>	2 - 6 AWG	275 lb-in (31.1 N-m)
Table 2S350		IHI Connectors		
350 kcmil- 2 AWG	90	262 kcmil - 2 AWG	350 kcmil - 2 AWG	375 lb-in (42.4 N-m)
2 - 6 AWG	90	2 AWG - 4 AWG	2 - 6 AWG	275 lb-in (31.1 N-m)
Table 2S600		IHI Connectors		
BNVN	90	444 kcmil - 2 AWG	600 kcmil - 4 AWG	500 lb-in (56.5 N-m)
CSA, 200116 UL Listed 84JM ZMVV E129884		(# ) FLEX-covers stranding classes within G, H, I/DLO, Metric class 5 and K/MTW, (##) mm <sup>2</sup> sizes within AWG/kcmil ranges are included		



Figure 1

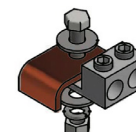


Figure 2

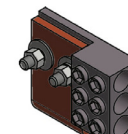


Figure 3

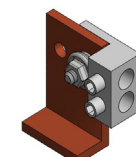


Figure 4

Table T3A2-600N		Ilsco		
<ul style="list-style-type: none"><li>• T3A2-600N;</li><li>• CSA Certified</li><li>• UL 486A/B Listed, UL File E6207</li><li>• Must be mounted with a minimum of 2 bolts</li></ul>				
Item ID	Conductor Range	Bolt/Stud Size	Hex Size	Tightening Torque
T3A2-600N	600 kcmil-2AWG	1/2	1/2	500 lb-in (56.5 N-m)