









Warnings and Cautions

Warning 	Dangerous Voltage Warning: warns of situations in which a high voltage can cause injury and/or equipment damage. The text next to this symbol describes ways to avoid danger.
Warning 	General Warning: warns of situations that can cause physical injury and/or equipment damage by means other than electrical. The text next to this symbol describes ways to avoid the danger.

General Safety Instructions

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

**All electrical connections must be re-torqued annually.*

Field Wiring

Field Wiring Connection Terminals

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

VTF dV/dt Filter Model Number	Current Rating (A)	Wire Size (AWG)	Torque (lb-in)
VTF-46-DE	2	8 - 14	30
VTF-246-CFG(-N1)	3	8 - 14	30
VTF-246-DGH	4	8 - 14	30
VTF-24-FH(-N1)	6	8 - 14	30
VTF-246-GJJ(-N1)	8	8 - 14	30
VTF-246-HKL(-N1)	12	8 - 14	30
VTF-24-JL	16	4 - 12	20
VTF-46-LM(-N1)	18	4 - 10	20
VTF-4-M	21	4 - 10	20
VTF-246-KMN(-N1)	25	4 - 8	20
VTF-46-NP(-N1)	27	4 - 8	20
VTF-246-LPQ(-N1)	35	6 - 8	30
VTF-246-MQR(-N1)	45	6	30
VTF-246-NRS(-N1)	55	1 - 4	35
VTF-246-PSU(-N1)	80	1 - 3	35
VTF-246-RUV(-N1)	110	2/0 - 1/0	50
VTF-246-SVW(-N1)	130	2/0	50
VTF-246-TWX(-N1)	160	250 MCM - 3/0	375
VTF-246-UXY(-N1)	200	two 2/0 - 1	50
VTF-246-VYZ(-N1)	250	two 2/0	50
VTF-46-ZI(-N1)	305	two 350 MCM - 3/0	375
VTF-246-XIO(-N1)	362	two 350 MCM - 4/0	375

AutomationDirect

automationdirect.com

AutomationDirect

3505 Hutchinson Road
Cumming, GA USA 30040
800-633-0405

VTF Installation Guide

Automation Direct

automationdirect.com

Version 2.0 Part # 31634 Aug. 18, 2023

Installation Instructions

Installation Checklist

- Please see VTF installation drawings for unit dimensions, mounting hole pattern, mounting orientation, wire entry locations, unit weights, and other unit specific installation notes.
- Ensure installation location will not be exposed to direct sunlight, rain or dripping liquids, corrosive liquids or gases, explosive or combustible gases or dust, excessive airborne dirt and dust, or excessive vibration.
- Select mounting area that will allow adequate cooling air and maintenance access.
- Ensure all wiring conforms to the requirements of the National Electric Code (NEC) and/or other applicable electrical codes.
- Ground the VTF to a dedicated system ground to ensure safety and filter performance. Use properly sized grounding conductor.
- Wire the output power terminals of the VFD, T1(U), T2(V), & T3(W) to the input terminals of the VTF: A1(U), B1(V) & C1(W).
- Wire the output power terminals, of the VTF: A2(T1), B2(T2) & C2(T3) to the motor power connections.
- Ensure VFD is set for operating modes and ranges that are compatible with the VTF Output Filter.
- Check entire system thoroughly before energizing and operating any equipment.

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

Verify the Application

Make sure the VTF is correct for the application. The current rating of the VTF should be sized to handle the FLA rating of the motor but not to exceed 110% of the VFD output current rating. This output filter is best applied matched closely to the load. The VTF is not selected by the VFD input current rating. When sized and applied to non-regen, standard 6-pulse VFDs, the VTF will limit motor terminal peak input voltage to 150% of the bus voltage with a wire lead length of 1,000 feet and a carrier frequency of 4kHz. Maximum lead length and carrier frequency can vary depending on wire lead type. For best performance, the VTF should be installed within 10 feet of the drive.

Variable Frequency Drive Settings

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

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

Mounting an Open Panel Unit

When mounting an open panel unit in your own enclosure, you must provide an enclosure that is adequately sized and ventilated sufficiently to prevent overheating. The filter is designed with a maximum ambient temperature of 40° C (104°F). If the ambient temperature exceeds this value, for any open or enclosed VTF unit, it is the responsibility of the customer to provide auxiliary cooling to reduce the ambient operating temperature around the VTF filter. Using auxiliary cooling devices such as cooling fans, heat exchangers, or possibly air conditioning units is recommended when required to maintain the proper operating temperature.

The VTF must be mounted, as per the unit installation drawing, on a smooth, solid surface, free from heat, dampness, and condensation. Mounting it oriented as per drawing is important for natural convection cooling. A metal plate is provided to mount the VTF on a composite surface. Please see installation drawings for unit dimensions, mounting orientation, equipment spacing, wire entry locations, and unit weights.

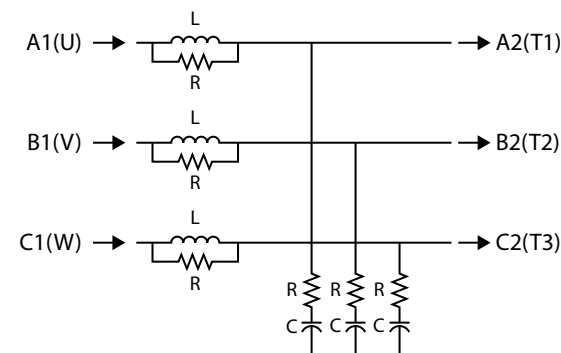
Power Wiring

The conduit and wiring from the output of the VFD to the motor must be routed to the VTF and then to the motor. We recommend a separate dedicated conduit run for each VFD/filter/ motor run unless properly shielded and segregated wiring procedures are practiced. Parasitic and induced capacitance can greatly reduce the effectiveness of the filter performance. Under no circumstances should you wire both control and power wire in the same conduit unless the wire way is specifically designed for this practice. The filter temperature is sensitive to lead wire over sizing. 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 VTF filter must be connected to the ground of the premise's wiring system. This can be conducted by identifying a known premise's ground near by the filter or running a special ground 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.

Wiring Diagram



Product Specifications

- Available Range: 2 - 362 Amps, 208 V - 600 V, 3/4 - 350 HP
- Max Operation Frequency 60Hz
- UL Listed
- Open or UL Type1 Available
- Efficiency \geq 98%
- Insulation Rating: 600 V Class
- Insulation Class: Class H (180°C or better)
- Maximum Altitude: 2000 m (6,000 ft) Derating necessary above 2000 m
- Lead Length: 1,000 ft
- Ambient Temp: Min -25°C to Max 40°C
- For use with three phase VFDs operating at 2kHz-4kHz PWM carrier frequency and with a maximum motor cable size necessary to achieve a 5% voltage drop at 1,000 ft.