Drives Accessories – Output Filters for Multiple AC Drives

VTF Series Drive Output Filters

Extend the life of your motors and cables by reducing the harmful effects of voltage spikes due to voltage wave reflection. Voltage wave reflection is a function of the voltage rise time (dv/dt) and the length of the motor cables.

AutomationDirect VTF series drive output filters protect motors and cables by combining a patented dampening circuit with a low pass filter to increase the voltage rise time (dt out of dv/dt), thereby preventing voltage spikes from exceeding 1,000V.

The impedance on either end of the cable run does not match, causing voltage pulses to be reflected back in the direction from which it arrived. As these reflected waves encounter other waves, their values add, causing higher peak voltage.

As wire length or carrier frequency increases, the overshoot peak voltage also increases.

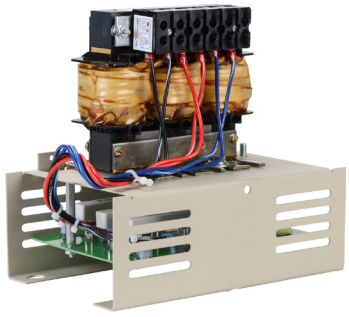
Peak voltages on a 480V system can reach 1,600V, and 2,100V on a 600V system. These high peak voltages can cause a rapid breakdown of motor insulation, leading to motor failure.

Features:

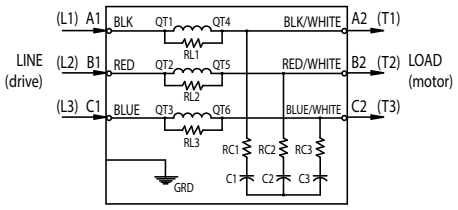
- Protect cable runs and reduce motor heating, noise, and vibration.
- Prevent motor failure with protection against motor insulation breakdown.
- Reduce Common Mode Noise by a minimum of 30%.
- Improve system productivity and increase bearing life and up-time.
- Protect long motor lead lengths up to 1,000 feet.
- Carrier Frequency: 2–4 kHz
- Efficiency ≥ 98%
- Operation up to 60Hz output drive frequency.
- Warranty: One (1) year of useful service, not to exceed 18 months from the date of shipment.

Agency Approvals:

- cULus listed (E197592)

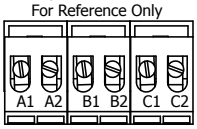


INDUCTOR TERMINALS A1,A2,B1,B2,C1,C2



INDUCTOR AND BOARD ASSEMBLY CONNECTIONS

(Customer Connections)
Markings On Terminal Block
For Reference Only



- *For CFW100 drive compatibility, please refer to* WEG CFW100 AC Drives - Accessories on page tCFW-15.
- *For CFW300 drive compatibility, please refer to* WEG CFW300 AC Drives - Accessories on page tCFW-8.
- *For GS1 drive compatibility, please refer to* GS1 Series Specifications on page tGSX-2.
- *For GS2 drive compatibility, please refer to* GS2 Series Specifications on page tGSX-52.
- *For GS3 drive compatibility, please refer to* LR Series Line Reactors on page tGSX-111.
- *For GS4 drive compatibility, please refer to* GS4 Drives Accessories-Line/Load Reactors on page tGSX-113.
- *For GS20(X) drive compatibility, please refer to* GS20(X) Accessories-Line Reactors/VTF Filters on page tGSX-44.

Output Filters are impregnated with 100% solid epoxy resin. All insulation varnish systems are rated H (180°C) or class R (220° C), 600V. (Class H up to 110A VTF-246-RUV; Class R from 130A Up VTF-246-SVW)

Drive Output Filters – VTF Series – for Multiple AC Drives														
Part Number	Price	Filter Specs		Applicable Motor Sizes*				Phases	Watt Loss	Wire Size [AWG]	Terminal Torque [lb·in]	Fasteners	Weight [lb]	Dimension Drawing #
		Rated Voltage	Max Rated Amps	208V Rated HP	230V Rated HP	460V Rated HP	575V Rated HP							
VTF-46-DE		208–600 VAC	2	-	-	0.75	1	3	75	12-14	10	6/40 x 5/16 flathead	8	1
VTF-246-CFG			3	0.5	0.5	1.5	2		75	12-14	10	6/40 x 5/16 flathead	8	
VTF-246-DGH			4	0.75	0.75	2	3		75	12-14	10	6/40 x 5/16 flathead	8	
VTF-24-FH			6	1	1.5	3	-		80	12-14	10	6/40 x 5/16 flathead	8	
VTF-246-GJJ			8	2	2	5	5		90	12-14	10	6/40 x 5/16 flathead	8	
VTF-246-HKL			12	3	3	7.5	10		95	12-14	10	6/40 x 5/16 flathead	8	
VTF-24-JL			16	-	5	10	-		95	4-12	20	1/4-28 x 3/8	12	2
VTF-46-LM			18	5	-	10	15		110	4-10	20	1/4-28 x 3/8	12	
VTF-4-M			21	-	-	15	-		110	4-10	20	1/4-28 x 3/8	12	
VTF-246-KMN			25	7.5	7.5	15	20		110	4-8	20	1/4-28 x 3/8	12	
VTF-46-NP			27	-	-	20	25		110	4-8	20	1/4-28 x 3/8	14	
VTF-246-LPQ			35	10	10	25	30		130	6-8	20	n/a (captive)	17	3
VTF-246-MQR			45	-	15	30	40		135	6	20	n/a (captive)	17	
VTF-246-NRS			55	15	20	40	50		145	1-4	20	n/a (captive)	17	
VTF-246-PSU			80	20	30	60	75		255	1-3	35	n/a (captive)	23	4
VTF-246-RUV			110	30	40	75	100		245	2/0 - 1/0	50	7/16-20 x 9/16	40	5
VTF-246-SVW	1.00		130	40	50	100	125		270	2/0	50	7/16-20 x 9/16	55	6

** - Motor HP ratings by voltage are based on NEC currents. For voltages with no HP listed, pick the VTF with max rated amps slightly higher than the application motor amp rating.*

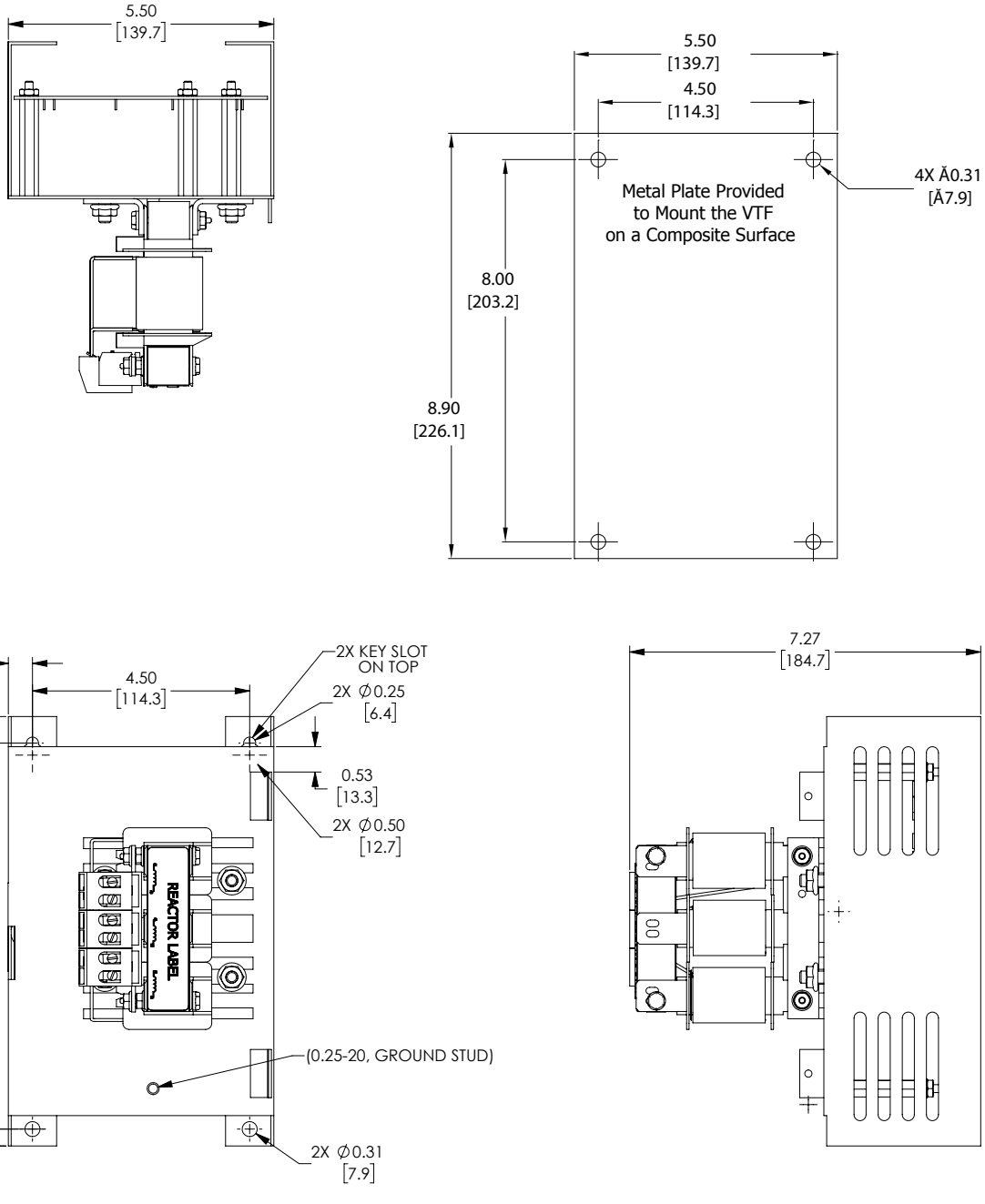
Properly sized and applied, The manufacturer guarantees that the VTF will limit motor terminal peak input voltage to 150% of the bus voltage with a wire lead length of 1,000 feet and a carrier frequency of 4 kHz. Maximum lead length and carrier frequency can vary depending on wire lead type. If a properly selected, installed, and loaded VTF filter fails to meet the guaranteed performance levels, The manufacturer will provide the necessary components or replacement filter at no additional charge. The manufacturer does not take responsibility for additional installation or removal costs, to include, but not limited to, replacement of third party equipment.
Minimum System Requirements for Guarantee – In order to achieve the performance levels as stated in this guarantee, the electrical system must adhere to the following: The VTF must be sized at no more than 110% of the drive output current rating. If the load has a potential for overhauling, the drive must be equipped with braking resistors or other features limiting bus voltage to no more than the level of the peak line voltage. The VTF must be wired no more than 10 feet from the drive.

Drives Accessories – Output Filters for Multiple AC Drives

Dimensions – VTF Series Output Filters

(Units = in [mm]) ***See our website: _____ for complete engineering drawings.***

1) VTF Filters Dimension Drawing #1
VTF-46-DE, VTF-246-CFG, VTF-246-DGH, VTF-24-FH, VTF-246-GJJ, VTF-246-HKL

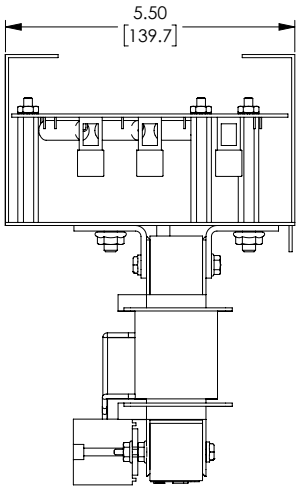


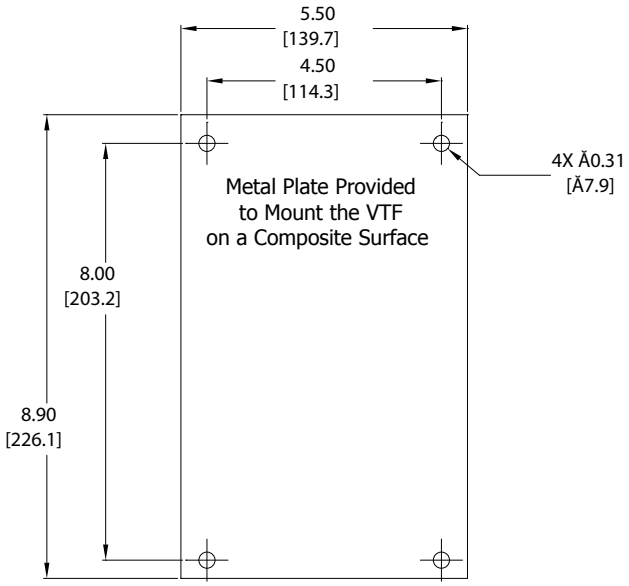
Drives Accessories – Output Filters for Multiple AC Drives

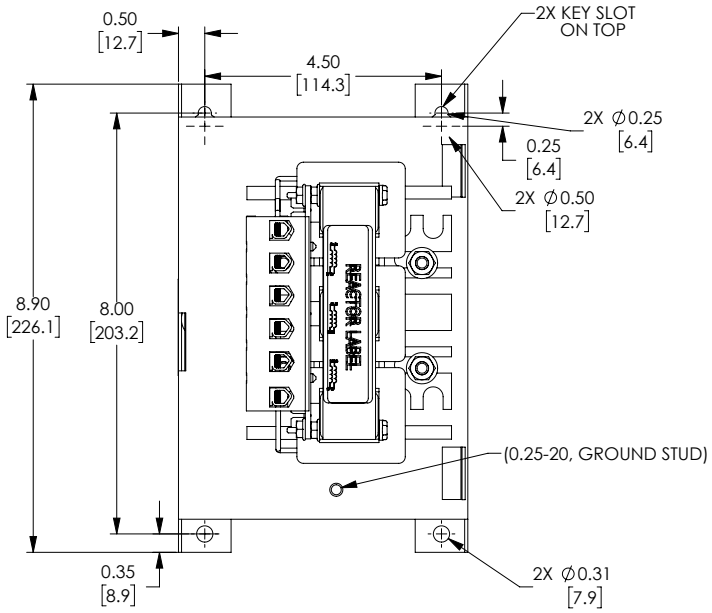
Dimensions – VTF Series Output Filters

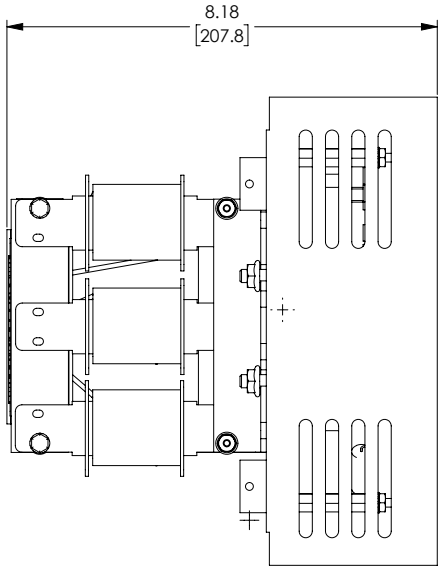
(Units = in [mm]) ***See our website: _____ for complete engineering drawings.***

2) VTF Filters Dimension Drawing #2
VTF-24-JL, VTF-246-KMN, VTF-46-LM, VTF-4-M, VTF-46-NP







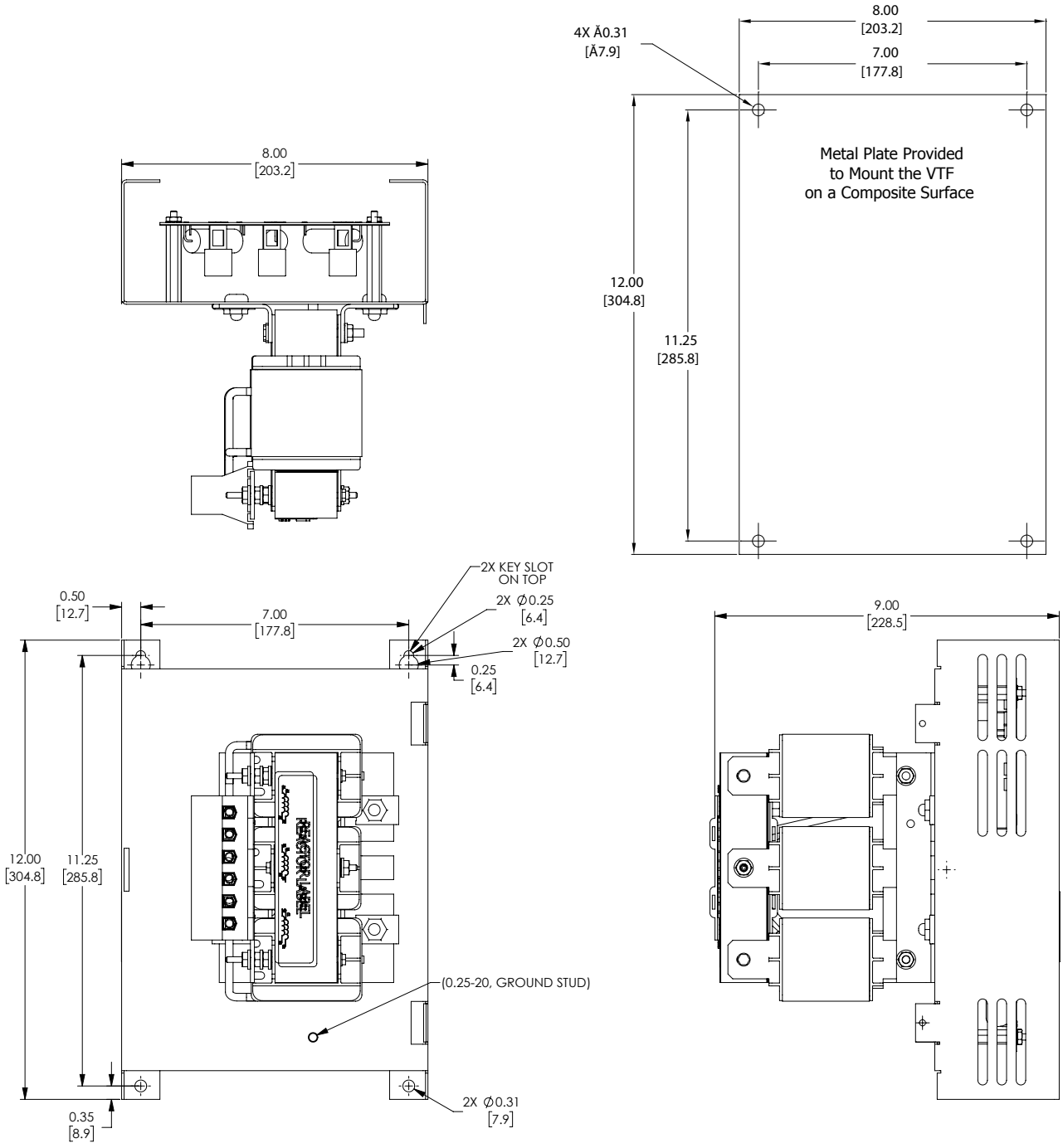


Drives Accessories – Output Filters for Multiple AC Drives

Dimensions – VTF Series Output Filters

(Units = in [mm]) ***See our website: _____ for complete engineering drawings.***

3) VTF Filters Dimension Drawing #3
VTF-246-LPO. VTF-246-MOR. VTF-246-NRS

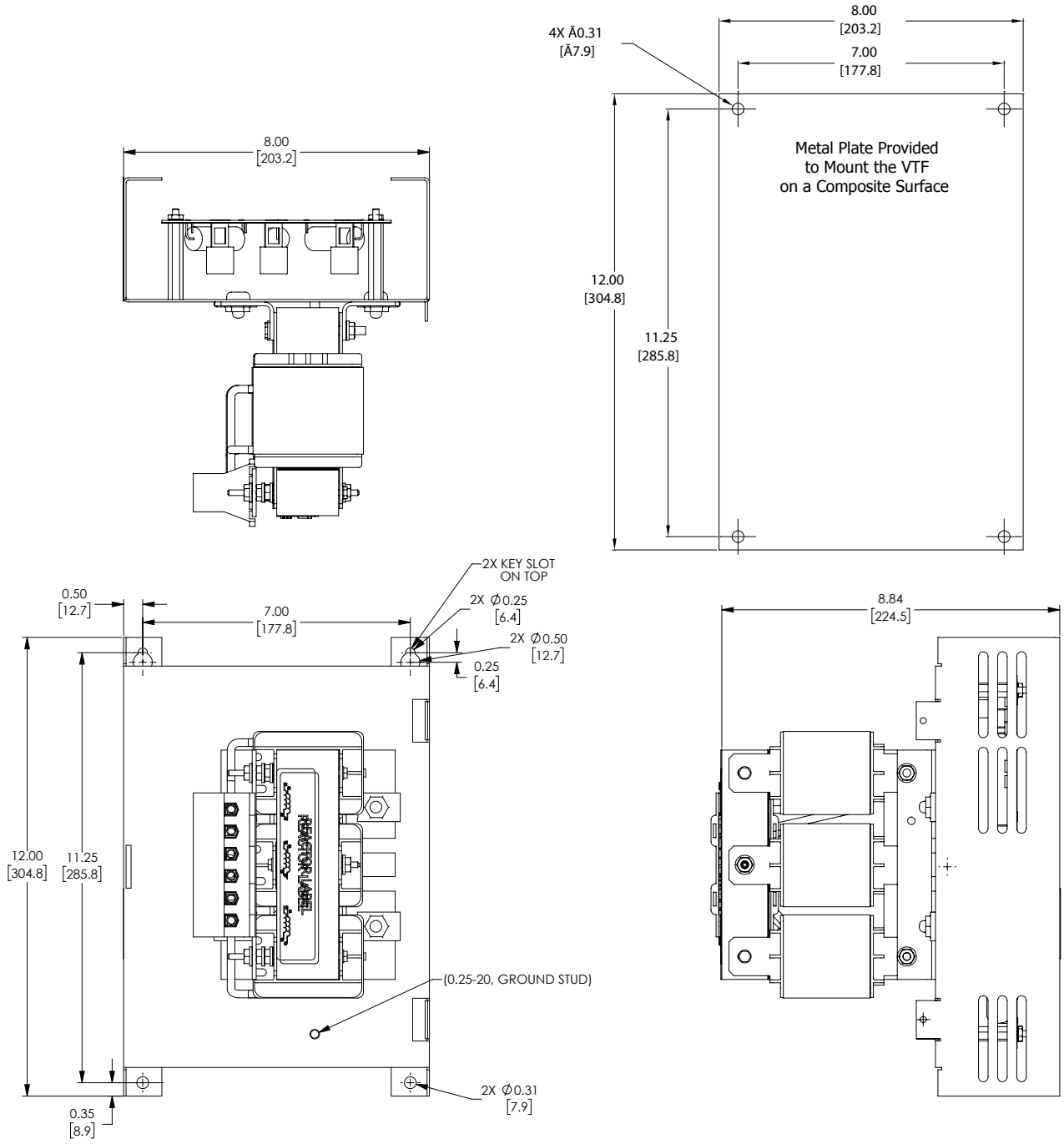


Drives Accessories – Output Filters for Multiple AC Drives

Dimensions – VTF Series Output Filters

(Units = in [mm]) ***See our website: _____ for complete engineering drawings***

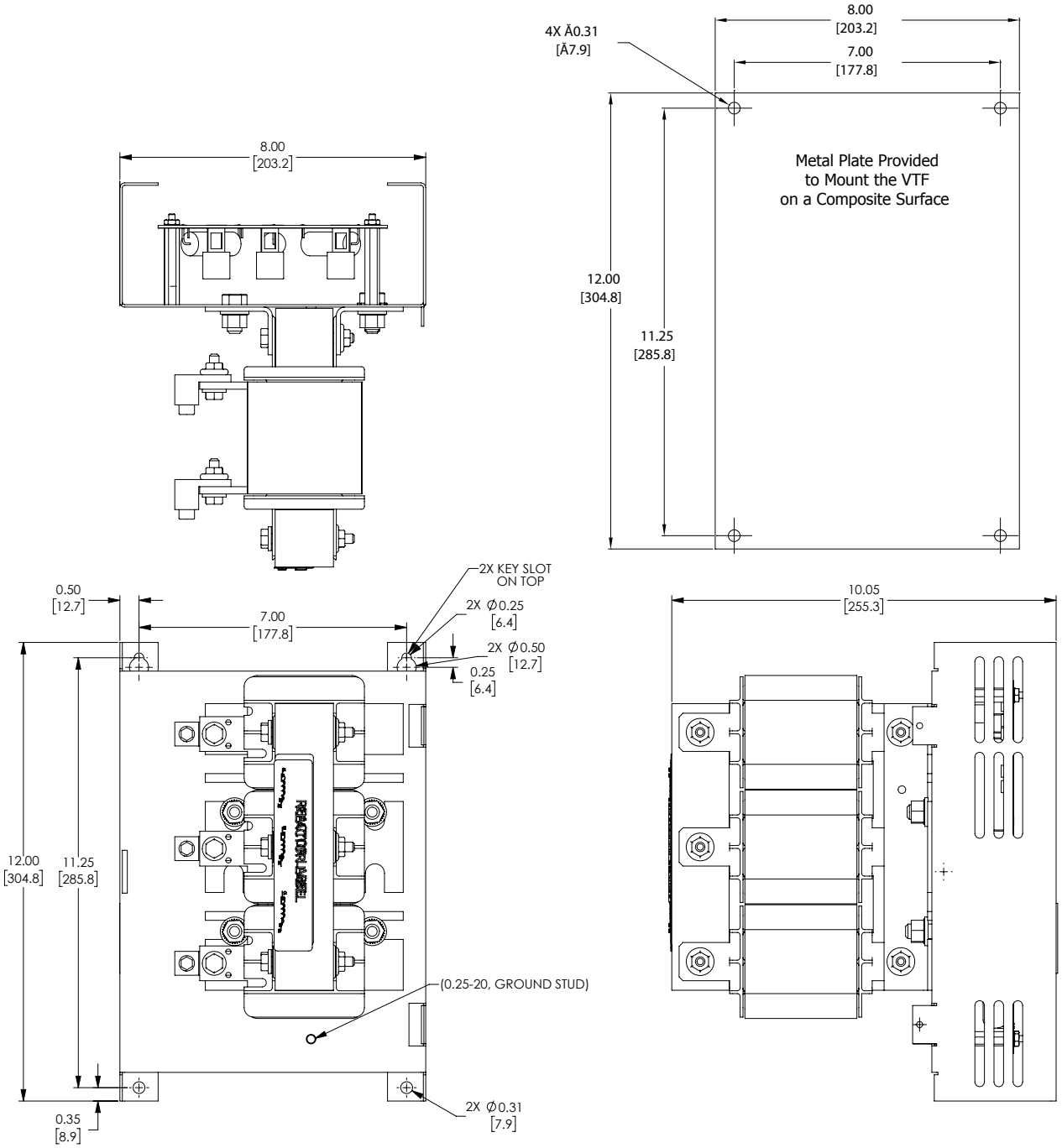
4) VTF Filters Dimension Drawing #4
VTF-246-PSU



Dimensions – VTF Series Output Filters

(Units = in [mm]) ***See our website: _____ for complete engineering drawings***

5) VTF Filters Dimension Drawing #5
VTF-246-RUV

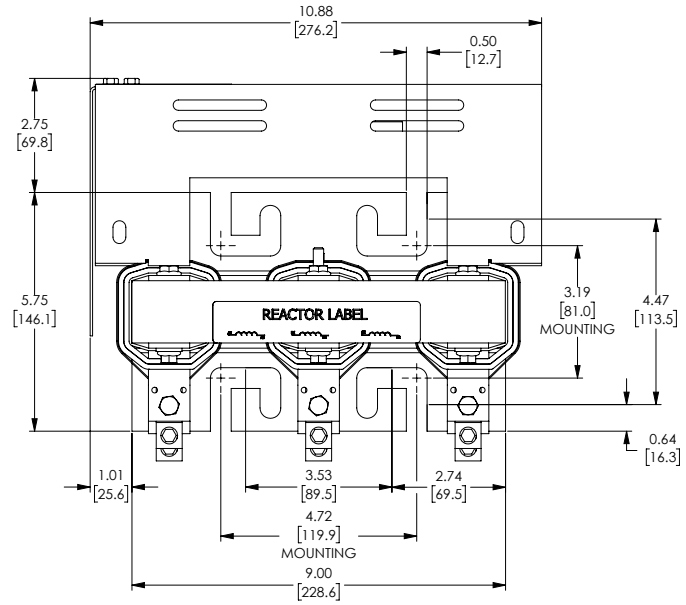


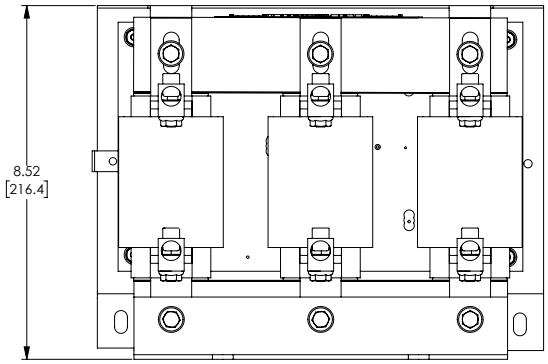
Drives Accessories – Output Filters for Multiple AC Drives

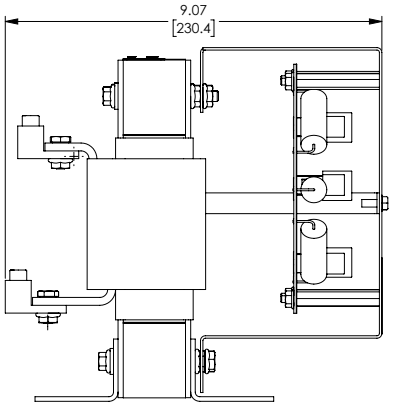
Dimensions – VTF Series Output Filters

(Units = in [mm]) ***See our website: _____ for complete engineering drawings***

6) VTF Filters Dimension Drawing #6
VTF-246-SVW

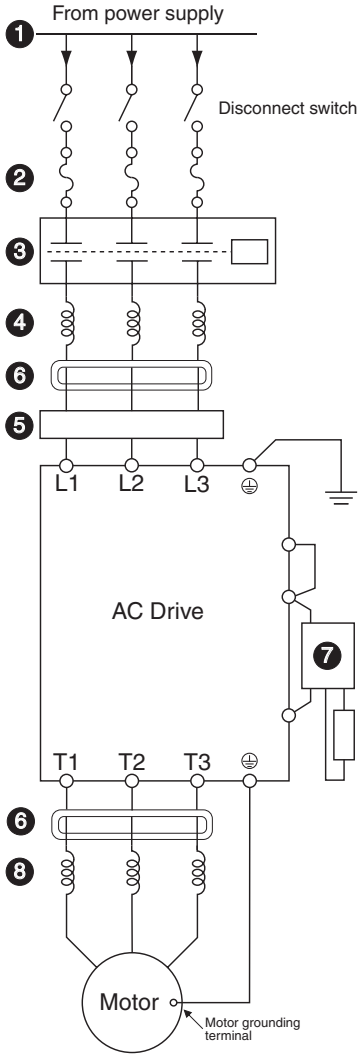






AC Drives Optional Accessories – Overview

Drive Accessories
(not all accessories are applicable for every drive model)



❶ Power Supply

Please follow the specific power supply requirements as detailed in the specific drive manual.

❷ Fuses

Input fuses protect the AC drive from excessive input current due to line surges, short circuits, and ground faults. They are recommended for all installations and may be required for UL-listed installations.

❸ Contactor (Optional)

Do not use a contactor or disconnect switch for run/stop control of the AC drive and motor. This will reduce the operating life cycle of the AC drive. Cycling a power circuit switching device while the AC drive is in run mode should be done only in emergency situations.

❹ Input Line Reactor (Optional)

See the Line Reactors section at for more information.

Input line reactors protect the AC drive from transient overvoltage conditions, typically caused by utility capacitor switching. The input line reactor also reduces the harmonics associated with AC drives. Input line reactors are recommended for all installations.

❺ EMI filter (Optional)

See the EMI Filters section at for more information.

Input EMI filters reduce electromagnetic interference or noise on the input side of the AC drive. They are required for CE compliance and recommended for installations prone to or sensitive to electromagnetic interference.

❻ RF filter (Optional)

RF filters reduce the radio frequency interference or noise on the input or output side of the inverter.

❼ Braking Unit and/or Braking Resistor (Optional)

Dynamic braking allows the AC drive to produce additional braking (stopping) torque. AC drives can typically produce between 15% & 20% braking torque without the addition of any external components. The addition of optional braking may be required for applications that require rapid deceleration or high inertia loads.

❽ Output Load Reactor or Voltage Time (dV/dT) Filter (Optional)

Output line reactors protect the motor insulation against AC drive short circuits and IGBT reflective wave damage, and also "smooth" the motor current waveform, allowing the motor to run cooler. They are **recommended for operating "noninverter-duty" motors and when the length of wiring between the AC drive and motor is less thar 100 feet.**

Voltage Time filters provide enhanced protection for motors with distances up to 1,000 feet.

Voltage Time filters provide even more protection against wave reflection and reduce common mode noise. They are recommended when the length of wiring between the AC drive and motor is from 100 feet up to 1,000 feet.

See for specific product offerings.