

# EMI dV/dt Filter for Bipolar Stepper Motors DIN Rail Mounted

- Improve Reliability of Your Motor
- Reduce EMI in Your Equipment
- Reduce EDM-Caused Vibrations
- No Programming Changes Required

Operation of a stepper motor causes a number of problems in equipment, including EMI pollution of and damage to the motor's bearings from leakage currents via electrical discharge machining (EDM), as well as resulting vibration. OnFILTER's patented TV-series filters shrink EMI spectrum and provide reduction of ground currents in a range of typically 30 to 80 times.

TV series motor filters are designed for incorporation into automated equipment containing bipolar stepper drives. Filters are small in size and are placed next to the drives to assure that the cables to the motors don't carry excessive EMI that pollutes the tool causing interference problems.

TV series motor filters are designed for incorporation into automated equipment containing servo or VFD drives.



## Applications

- Industrial robotics
- Automated tools
- Control panel UL 508A
- Semiconductor fabrication
- Electronic assembly
- Reduction of vibration due to bearing damage
- Wherever EMI and EOS are a problem

## Features

- Reduction of high-frequency currents
- Compliance with IEC60034-25 and IEC61800-3
- Prevention of EDM (Electrical Discharge Machining)
- Reduction of overall EMI
- Easy plug-in installation
- No mechanical attachments
- Optimized for most PWM motors
- Effective management of rise and fall times of drive pulses

## Reduced EMI in Equipment

TV series filters greatly reduce high-frequency noise on ground, as well as overall EMI in the tool, lowering risk of electrical overstress (EOS) and reducing errors in automated equipment and testers.

## IEC60034-25 and IEC61800-3 Compliance

dV/dt filters are required for stepper motors to reduce EMI and to extend life of motors. OnFILTER's TF-series patented filters reduce noise from PWM drive pulses beyond capabilities of common reactors, substantially reducing ground EMI leakage through the motor bearing

## Reduction of EDM

High-frequency currents through bearings literally eat into the bearings, irreversibly damaging them and causing vibrations. TV series filters prevent EDM damage by blocking these currents from reaching motors.

## No Mechanical Attachments

TV series filters require no mechanical attachments to a motor and no maintenance. Filters' small size enables easy installation. Unlike mechanical approach, TV-series filters provide complete EMI reduction, addressing PWM noise problem at its core.

**TV05101**  
Stepper Motor  
EMI Filter  
10A 50V  
DIN Rail Mounted

Suitable for UL 508A Panels

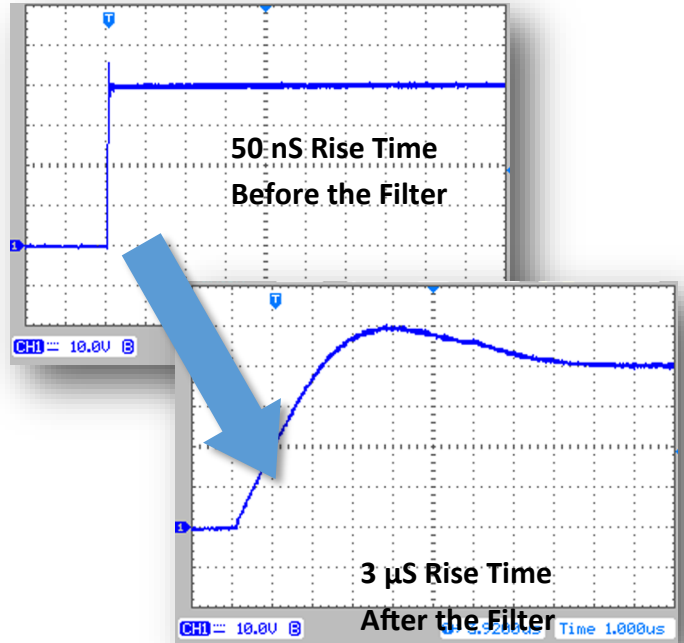


## Specification

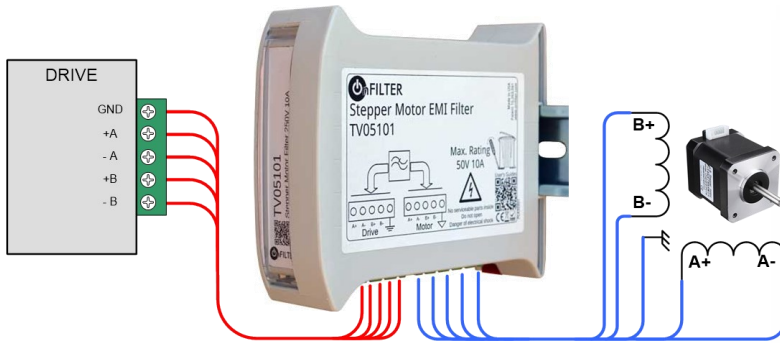
OnFILTER stepper motor filter utilizes patented and proprietary technology to provide maximum EMI suppression and to reduce high-frequency currents from PWM stepper motor operation.

Parameter	TV05101
<b>DRIVE FILTER</b>	
Drive Voltage, max.	50V
Drive Current, max.	10A
Rise/Fall Times Stretch, typ.	20 ... 30 times
Ground Current Reduction (typ.)	30...80 times
Nominal DC Resistance	<0.2Ω
DIN Rail Case Width	1.4" / 36mm
TV05101 qualifies for UL 508A panels as low voltage, low energy circuit (the filter itself consumes very little current)	

## Smooth Drive Pulse Edges

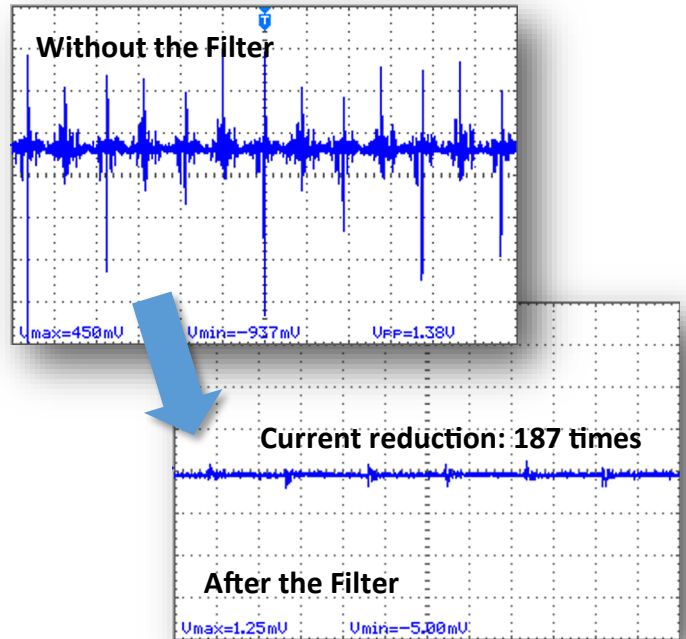


## Typical Connection



For maximum performance make sure that ground connection from the drive to the motor goes through the filter

## Reduction of Ground Current



Current is measured with Tektronix' CT1 probe 5mA/mV

## Ordering Information

### Stepper Motor EMI Filter

Model	Motor	Mount
<b>TV05101</b>	50V 10A	DIN Rail

OnFILTER' stepper motor EMI filters work with the majority of bipolar stepper motors without any adjustments in software.

You would need to know just two parameters: max. drive voltage and current - both are typically indicated on a label of the motor itself, or on the drive/controller. Do not exceed specified maximum rating of the filter as this may damage the filter itself, the motor, the motor controller and, possibly, your equipment.

For VFD and servo motors please see our SF/SV series filters.



See other configuration of stepper motor filter



OnFILTER, Inc.

730 Mission Dr. Ste. 102  
Santa Cruz, CA 95060 U.S.A.  
Tel. +1.831.824.4052  
FAX +1.206.350.7458

[www.onfilter.com](http://www.onfilter.com)  
[info@onfilter.com](mailto:info@onfilter.com)

