

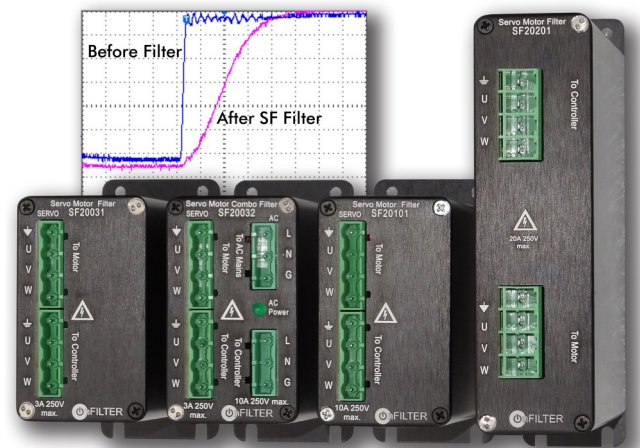
# EMI $dV/dt$ Filters for Servo Motors and VFD

Improve Reliability of Your PWM-Driven Motors  
Reduce EDM-caused Vibrations  
Reduce EMI and Electrical Overstress

Operation of PWM-driven motors - servo and variable frequency drives (VFD) - causes a number of problems in equipment, including damage to the motor's bearings from leakage currents via electrical discharge machining (EDM), as well as resulting vibration. Strong EMI generated by PWM-driven motors causes errors in equipment.

OnFILTER' patented  $dV/dt$  SV-series filters are not simple reactors—they are complete EMI filters incorporating common mode, differential mode, and ground filtering providing reduction of ground currents in a range of typically 50 to 100 times.

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



## Applications

- Industrial robotics
- Automated tools
- 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 IEC60034-17/-25
- Prevention of EDM (Electrical Discharge Machining)
- Reduction of overall EMI
- Easy plug-in installation
- No mechanical attachments
- Combined drive and AC filtering in some models
- Optimized for most PWM motors
- Effective management of rise and fall times of drive pulses

## Reduction of EDM

High-frequency currents through bearings cause electrical discharge machining (EDM), literally eating into the bearings, irreversibly damaging them and causing vibrations. SF series filters prevent EDM damage by blocking these currents from reaching motors.

## IEC60034-17/-25 Compliance

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

## No Mechanical Attachments

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

## Reduced Ground EMI

SF 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.

## VFD and Servo Motor EMI Filters

SF20031  
SF20032  
SF20101  
SF20201

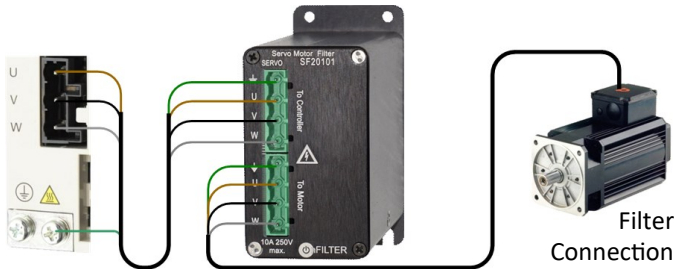


## Specification

OnFILTER servo filters utilize proprietary technology to provide maximum noise suppression and reduce high-frequency currents from servo and variable frequency motor operation.

Parameter	SF20031	SF20032	SF20101	SF20201
<b>DRIVE FILTER</b>				
Drive Voltage, max.	250V	250V	250V	250V
Drive Current, max.*	3A	3A	10A	20A
Rise/Fall Times, typ.	1.5µS	1.5µS	1.2µS	1.2µS
Ground Current Reduction (typ.)	50...100 times			
<b>AC FILTER</b>				
AC Voltage, max.	N/A	250VAC	N/A	N/A
AC Current, max.	N/A	10A	N/A	N/A
Noise Reduction, typ.	N/A	>20dB	N/A	N/A
Nominal DC Resistance	<0.2Ω	<0.2Ω	<0.2Ω	<0.2Ω
<b>Dimensions w/plug-ins</b>				
Width	1.85"	1.85"	1.85"	1.56"
	47mm	47mm	47mm	40mm
Height	4.0"	4.0"	4.0"	6.45"
	102mm	102mm	102mm	164mm
Depth	5.87"	5.87"	5.87"	7.22"
	150mm	150mm	150mm	184mm
* at duty cycle (motor exerting max. torque) of 20%				

## Typical Connection



## Ordering Information

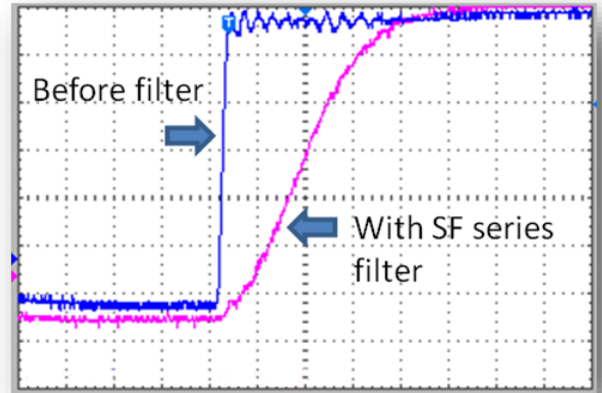
OnFILTER VFD/servo motor EMI filters work with the majority of servo and variable frequency controllers and motors.

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 servo/VFD drive. 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.

Model	Motor	AC Power
<b>SF20031</b>	250V 3A	N/A
<b>SF20032</b>	250V 3A	250VAC 10A Single Phase
<b>SF20101</b>	250V 10A	N/A
<b>SF20201</b>	250V 20A	N/A

Contact us for other configurations

## Smooth Pulse Edges



## Bearings' Ground Current Reduced 50...100 Times



Current is measured with Tektronix CT1 probe 5mA/mV

For DIN rail mount see our SV series filters



**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)

RECOGNIZED COMPONENT



Intertek

