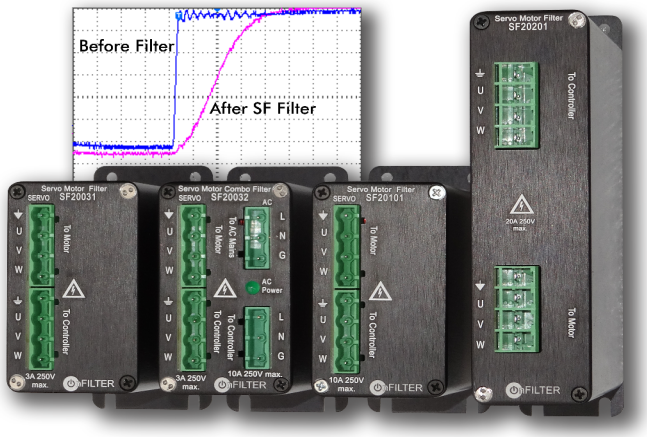
EMI dV/dt Filters for Servo Motors and VFD

Improve Reliability of Your PWM-Driven Motors
Comply with IEC60034-17/-25
Reduce EMI and Electrical Overstress

Operation of PWM-driven motors, such as 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) and to motor's insulation. PWM-generated noise causes errors in operation of electronic equipment. Electronic components processed on PWM-driven tools such tools as IC handlers, wire bonders, SMT pick-and-place machines and many others can be subject to electrical overstress (EOS), affecting yield and reliability.

OnFILTER's SF-series filters substantially reduce high-frequency leakage currents in motors and in wiring, assisting in compliance with the requirements of IEC60034-17/-25. They also reduce interfering frequency noise within the tool resulting from operation of PWM-driven motors



Applications

- Industrial robotics
- Semiconductor fabrication
- Electronic assembly
- Disk drive manufacturing
- Aerospace/Military
- Wherever EMI and EOS are a problem

Features

- Reduction of high-frequency currents
- Compiance with IEC60034-17/-25
- Prevention of EDM (Electrical Discharge Machining)
- Reduction of overall EMI
- Easy plug-in installation
- No mechanical attachments
- Drive and AC filtering in some models
- Optimized for most PWM motors
- Effective management of rise and fall times of drive pulses
- Proprietary reduction of ground current

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 patent-pending filters reduce noise from PWM drive pulses beyond capabilities of generic filters, substantialy reducing leakage through the motor bearing preventing motor's failures

Reduction of EDM

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

No Mechanical Attachments

SF-series filters require no mechanical attachments to a motor. 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 Noise

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

PWM-Driven Motor EMI Filters

- SF20031
- SF20032
- SF20101
- SF20201

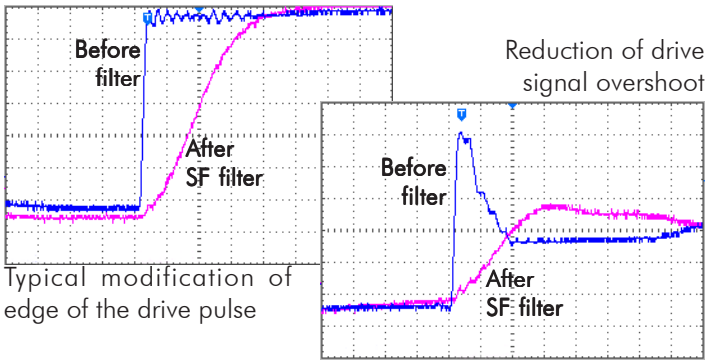
OnFILTER

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	SF 20032	SF20101	SF20201
DRIVE FILTER				
Drive Voltage, max.	250V	250V	250V	250V
Drive Current, max.*	3A	3A	10A	20A
Rise/Fall Times, typ.	1.5μS	1.5μS	1.2μS	1.2uS
AC FILTER				
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
Dimensions w/plug-ins				
Width	1.85″ 47mm	1.85″ 47mm	1.85″ 47mm	1.56″ 39.6mm
Height	4.0″ 102mm	4.0″ 102mm	4.0″ 102mm	6.45″ 164mm
Depth	5.87″ 150mm	5.87″ 150mm	5.87″ 150mm	7.22″ 183.4mm

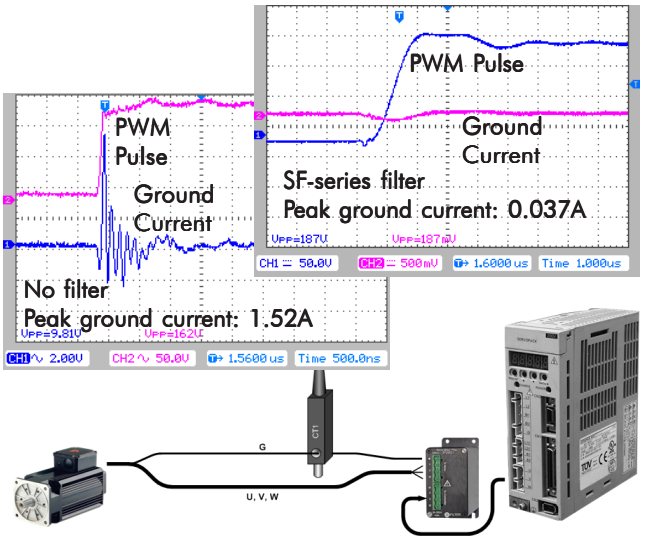
* at duty cycle (motor exerting max. torque) of 20%



Typical modification of edge of the drive pulse

Reduction of drive signal overshoot

Ground current without and with SF filter
Measured with Tekrtonix' CT1 probe 5mV:1mA



OnFILTER' SF-series PWM motor filters use patent-pending technology to reduce ground current which is a source of damage to the motor and EMI and EOS in equipment.

Complete EMI Protection

Complete EMI protection includes filtering in both motor drive signal and incoming AC power. One of SF-series filters - patent-pending SF20032 - combines both in one small unit. Two independent filters - AC and PWM drive - are combined to provide complete EMI protection, saving precious space in equipment and reducing cost. Both common-mode and differential noise are reduced.

Ordering Information

OnFILTER' PWM-driven 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 amplifier. 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
SF20031	250V 3A	N/A
SF20032	250V 3A	250VAC 10A Single Phase
SF20101	250V 10A	N/A
SF20201	250V 20A	N/A

Contact us for other configurations

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