

# Submersible Pump Filter

**Description:** Output Filter  
**Compatibility:** MSC-3  
 ZENER 8000  
 ECODRIVE 8000  
**Installation:** Refer to Installation manual IM00123

## Summary:

A number of submersible pumps are not 'Inverter Rated'. This means they are not designed and manufactured to meet the recommendations of IEC60034.17 for operation on Variable Speed Drives.

To overcome this problem a filter is often required to meet the manufacturer's requirements (Eg. Grundfos & Franklin).

Zener offers a filter that exceeds the published requirements for these pumps and provides additional benefits:

## The features & benefits include:

- IP66 Enclosed for ease of installation and protection against Dust & water
- Certified EMC compliance without screened motor cables
- Eliminate/ Reduce RF Interference
- Assurance for old motors and long cable runs
- Differential & Common Mode filtering
- $dV/dt$  reduction (100x better than IEC60034.17)
- Reduced Peak Voltages
- High Efficiency with energy recovery
- Light weight ratio per kW

## Description:

The Zener HPOF, IP66 and IP00 provide superior performance by combining differential filtering (phase to phase) and common mode filtering (phase to ground). The Zener HPOF limits  $dV/dt$  at the output of the filter to a maximum of 150V/us in both differential mode and common mode, which by far exceeds submersible pump manufacturer maximum  $dV/dt$  requirements of 500V/us. Zener filters have optimised snubber circuitry with energy recovery to keep filter losses as low as possible.

Due to the combination of low  $dV/dt$  and optimised snubber circuitry the peak voltage at motor terminals with a cable length of 200m is typically only 120% of peak mains voltage resulting in 704Vpk in a 415V system, well below submersible pump manufacturer's maximum allowable voltage of 850Vpk to 1000Vpk.

## Further Information:

For detailed information refer to the information sheet on ZENER filters or contact Zener for more details.



## General Specification:

**Enclosure:** IP00 High Performance Filter  
 IP66 High Performance High Efficiency Filter  
**Efficiency:** >99.4% (high Efficiency Filter)  
**Voltage:** 460VAC  
**Maximum Overload:** As per ZENER Drive rating  
**Ambient Temperature:** 50°C Continuous (based on Drive selection)  
**Frequency:** 50/60Hz (derate up to 120Hz)  
**Audible Freq.:** 2-16kHz, recommended 2kHz  
**EMC Compliance:** AS61800.3, Australian C-tick \*\*  
 C2 & C3  
 C1 (100m of unscreened/screened cable)

\*\* The ZENER Filter has been tested with the ZENER Drive for compliance to Australian EMC standards AS61800.3. With the high performance output filter compliance can be achieved without screened motor cables.

## IMPORTANT NOTE on Common Mode Filtering:

For any filter to guarantee common mode filtering (Phase to Ground) they must have a low impedance connection to the Drive or reference point on the AC supply. The performance of this type of filter is very site specific and variable and may not comply with EMC requirements due to high frequency currents flowing to ground. Some filters promoted as 'Sinewave' Filters may not provide this.

To achieve this higher level of performance and benefits of common mode filtering the ZENER filter has a connection to the DC bus.