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Harmonic Disturbance

Most common industrial variable speed drives (VSDs) for AC motors have an effect on the supply system because of the design of the drive input circuitry. The degree of this effect in producing harmonic distortion at levels of concern is largely determined by *characteristics of the supply* such as the supply rating and fault level and the level of existing harmonics. In other words harmonic effects are largely site dependent.

Many installations and equipment specifications require VSDs to comply to the Australian Standard AS2279 Part 2 “Disturbances in mains supply networks - Limitations of harmonics caused by industrial equipment”. It is critical for distribution authorities and end-users to realise that compliance with the Australian Standard AS2279 Part 2 cannot be demanded or determined for any VSD unless the appropriate installation details are specified. With this site information it is then possible to evaluate harmonic reduction requirements and ensure the design of the VSD installation will meet the specification.

DC Bus Choke:
Zener Electric VSDs employ a DC bus choke as opposed to an AC-side line choke to reduce the level of harmonics injected into the supply. The DC bus choke option is a highly effective means of reducing electrical disturbance associated with VSD harmonics. Not only does our substantial DC bus choke provide significant harmonic filtering, it also reduces the peak inrush currents when compared with a capacitor only DC bus design and provides an effective supply transient filter for the inverter. The reduction in peak current and current ripple in the DC bus reduces stress on and significantly enhances the life expectancy of the main power capacitors and input rectifier.

There are several methods which can be employed to evaluate harmonic reduction requirements depending upon the information available; select any one of the options in the attached table and return the completed form to your nearest Zener Distributor. Where more than one variable speed drive is installed, photocopy this page and complete one for each drive/motor installed. If you have any further questions please do not hesitate to contact us.

Assuring you of our continued co-operation and service.

Refer to our website to locate your nearest Zener distributor :

www.zener.com.au

Site Information

VSD supply (Select one option)	***Option 1:*** Distribution transformer rating:	System line voltage (volts)		
		System frequency (Hz)		
		Transformer rating (kVA)		
		Impedance (%)		
		Power factor on short circuit		
	Option 2: Fault level (MVA *or* kA):	System line voltage (volts)		
		System frequency (Hz)		
		Fault level (either MVA or kA)	MVA	
			kA	
		Power factor on short circuit		
	Option 3: Complex impedance:	System line voltage (volts)		
		System frequency (Hz)		
		Impedance (real, milli-Ohms)		
		Impedance (Imag, milli-Ohms)		
	Option 4: Inductance & resistance values	System line voltage (volts)		
		System frequency (Hz)		
		Resistance (milli-Ohms)		
		Inductance (micro-H)		
Other	Components between PCC and VSD	Resistance (milli-Ohms)		
		Inductance (micro-H)		
	Existing Harmonic Level at PCC	THD (%)		

Motor and Variable Speed Drive Information

Motor details	Nameplate details	Motor rated power (kW)	
		Motor rated voltage (V)	
		Motor rated current (A)	
		Motor rated speed (rpm)	
		Motor efficiency (%)	
	General	Motor load (%)	
		Continuous/Standby/Other	
Drive details	Zener Variable Speed Drive	Model Number	

Where more than one VSD is installed, photocopy this page and complete one for each VSD/ motor combination installed; where any VSD/motor is not running continuously e.g. standby set please indicate as such.