Comparision of 4.16kV air-cooled TMdrive-MVe2 (MVE2) Active Frond End VFD to Diode based VFDs

Inputs

		User Inputs
Key		Calculated Value
		Constants

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TECHNICAL INPUTS

Motor Inputs

Motor Power	1200	hp
Motor Power Factor	0.88	pu
Motor Efficiency	95.0	%
Motor Voltage	4160	V
Inputs valid & within range	Yes	
Motor kW Load	942	kW
Motor kVA Load	1071	kVA
Motor kVAR Load	509	kVAR
Motor Current Load	149	Amps

TMdrive-MVe2 inputs

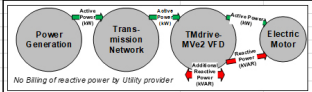
VFD Voltage	4160	V
VFD Power Factor	1	pu
VFD system efficiency	96.50	%
VFD power conv. + Aux loss	3.50	%
VFD Input Filter loss	0.00	%
VFD Output Filter loss	0.00	%
VFD Frame size	300	
VFD kVA Rating	1380	kVA
VFD Ampacity Limit	191	Amps

Comparision VFD Inputs

Case: TMdrive-MVe2 (corrected to 1.0pf)

Summary (when VFD used for motoring)

Total Cost of ownership (PV)	=	$	2,070,038
Additional Value due MVe2 AFE	=	$	32,395
Time horizon of installation	=		12 years

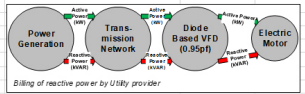


Step	Value	Unit
Scenario #1: VFD used for continous motor control		
Utility Metering (VFD Input)		
Utility Power draw	976	kW
Utility kVA draw	976	kVA
Utility kVAR draw	0	kVAR
Utility Current draw	136	Amps
Additonal Plant reactive power support from VFD		
Supply R-Power with selected frame	552	kVAR
Absorb R-Power with selected frame	552	kVAR

Case: Diode based VFD (uncorrected 0.95pf)

Summary (when VFD used for motoring)

Total Cost of ownership (PV)	=	$	2,100,147
Additional Value	=	$	-
Time horizon of installation	=		12 years

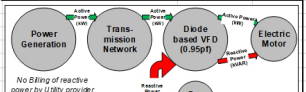


Step	Value	Unit
Scenario #1: VFD used for continous motor control		
Utility Metering (VFD Input)		
Utility Power draw	982	kW
Utility kVA draw	1033	kVA
Utility kVAR draw	323	kVAR
Utility Current draw	143	Amps
Additonal Plant reactive power support from VFD		
Supply R-Power with selected frame	0	kVAR
Absorb R-Power with selected frame	0	kVAR

Case: Diode VFD w/caps (corrects to 1.0pf)

Summary (when VFD used for motoring)

Total Cost of ownership (PV)	=	$	2,102,826
Additional Value	=	$	-
Time horizon of installation	=		12 years



Step	Value	Unit
Scenario #1: VFD used for continous motor control		
Utility Metering (VFD Input with caps in service)		
Utility Power draw	982	kW
Utility kVA draw	982	kVA
Utility kVAR draw	0	kVAR
Utility Current draw	136	Amps
Cap required to correct to 1.0pf with Diode VFD		
kVAR requirement	323	kVAR
Additonal Plant reactive power support from VFD		
Supply R-Power with selected frame	0	kVAR
Absorb R-Power with selected frame	0	kVAR