We need to know more about VFD's then our customers, as there is a lot of misinformation at the refineries on VFD's…also in our industry.

Myth one: We need to pull new wires! They think they would need to pull new wires or install new VFD motors….**not true**. If we supply them the enclosed Guardian filter none of that is required (see pages 4 and 5).

Myth two: They are expensive…..VFD's are cheaper than a motor starter.

Myth three: VFD's effect power factor negatively….**this is 100% wrong**. VFD's correct for power factor and save customers money. Goggle this question below. There are dozens of papers on the truth about VFD's and how they improve power factor and lower your costs.

Fact one for axial fans: VFD's allow us to have the more aggressive summer time pitch year-round so we get the best summer cooling (which is the whole point)…..**so now we get a cooling benefit that pays for the VFD's**. If we do not have a VFD (or AVT) we need a winter time pitch year-round so that lower pitch means less cooling in July.

Affinity Laws – Centrifugal Loads

%Speed	%Flow	%HP Required
100	100	100
90	90	73
80	80	51
70	70	34
60	60	21
50	50	13
40	40	6

Fact two: VFD's save power…..this doesn't have to be explained but a 10% reduction means a 30% HP savings as HP is cubed. See chart. All the power savings programs award credit when you add a VFD. See example of Save**ON**energy program (pages 2 and 3).

Fact three: VFD's lower night time summer noise…..when everyone is outside enjoying their patio, the gas plants (or refineries) lower the fan speed due to cooler evening air and the fans are quieter…….this is a major key advantage to VFD's and axial fans.

I hope this helps….

Nick Agius
National Rotating Equipment/ACHE Product Specialist
Canada/Alaska
19 Emery Ct, St Albert, Alberta, Canada,
T8N 5T3
Cell/Office: (780) 719-7413
MOTION CANADA

saveONenergy℠
RETROFIT PROGRAM

Variable Frequency Drive Eligible Measures Worksheet

System must operate a minimum of 2,000 hours per year to be eligible for Participant Incentives. Energy efficiency solutions, including those considered in this worksheet, can be complex. This worksheet does not endorse the design, engineering and installation completed for each particular component. Applicant's should consult with manufacturer of equipment, before modifying their system, to verify compatability.

Note: New construction or major renovation projects which are eligible under the **save**ON**energy** High Performance New Construction Program are not eligible under the **save**ON**energy** RETROFIT Program.

INSTRUCTIONS:
In order to calculate the Participant Incentive amount, enter the number of variable frequency drives (VFD) to be installed in the '**Quantity'** row. Based on the size of the motor on which the variable frequency drives will be installed on, determine the Participant Incentive per variable frequency drive and enter this amount in the **'Participant Incentive ($/VFD)'** row. The '**Total participant Incentive'** row will automatically populate based on this information. The '**Required Information'** must also be completed for each unit. The sum of the **'Total Participant Incentive'** amounts will be automatically populated in the **'TOTAL PARTICIPANT INCENTIVE REQUESTED'** field at the bottom of the worksheet. For more than six variable frequency drive sizes, please use an additional copy of this worksheet.

In order to receive your Participant Incentive payment, invoices showing proof of payment must be submitted to your LDC. It is recommended that you provide manufacturer technical specification sheets demonstrating that the equipment meets the program requirements. You may be required to provide additional information in connection with your Project in order for your Applicationto be approved.

Variable Frequency Drive (VFD) Incentives

Motor Size on which VFD is installed (HP)	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100
Participant Incentive ($/VFD)	$50	$80	$105	$160	$265	$400	$535	$805	$1,070	$1,340	$1,610	$2,145	$2,565	$3,220	$3,980	$4,835

Required Information	Example	#1	#2	#3	#4	#5	#6
Reason: "N"=New or "F"=Failed	N						
Location: Building and Room	North Pump						
VFD Manufacturer	ABC						
VFD Model Number	GH553						
Motor Size in Horsepower	1.5						
Motor Speed in RPM	1800						
Motor Efficiency	94.20%						
Annual Run Hours (actual)	5000						
Quantity	1						
Participant Incentive ($/VFD) (Table)	$80						
Total Participant Incentive	**$80**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Note: The Eligible Measures Lists and Eligible Measures Worksheets are based on assumptions and are subject to change and the incentive amounts do not include HST or other applicable taxes.

TOTAL PARTICIPANT INCENTIVE REQUESTED:	**$0.00**

Name of Applicant: _____

Company Name: _____

Building Address: _____

_____

saveONenergy℠
RETROFIT PROGRAM

Synchronous Belt Eligible Measures Worksheet

Systems must operate a minimum of 2,000 hours per year and must replace a V-belt to be eligible for Participant Incentives. Energy efficiency solutions, including those considered in this worksheet, can be complex. This worksheet does not endorse the design, engineering and installation completed for each particular component. Participants should consult with manufacturer of equipment, before modifying their system, to verify compatability.

Note: New construction or major renovation projects which are eligible under the **save**ON**energy** High Performance New Construction Program are not eligible under the **save**ON**energy** RETROFIT Program.

INSTRUCTIONS:
In order to calculate the Participant Incentive amount, enter the number of synchronous belts to be installed in the '**Quantity**' row. Based on the size of the motor on which the synch belt(s) will be installed on, determine the Participant Incentive per synch belt and enter this amount in the **'Participant Incentive ($/Synchronous Belt)'** row. The '**Total Participant Incentive'** row will automatically populate based on this information. The '**Required Information**' must also be completed for each unit. The sum of the '**Total Participant Incentive'** amounts will be automatically populated in the '**TOTAL PARTICIPANT INCENTIVE REQUESTED'** field at the bottom of the worksheet. For more than six synchronous belt sizes, please use an additional copy of this worksheet.

In order to receive your Participant Incentive payment, invoices showing proof of payment must be submitted to your LDC. It is recommended that you provide manufacturer technical specification sheets demonstrating that the equipment meets the program requirements. You may be required to provide additional information in connection with your Project in order for your Application to be approved.

Synchronous Belt Incentives

Motor Size on which Synchronous Belt is installed (HP)	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100
Participant Incentive ($/Synchronous Belt)	$5	$10	$15	$25	$40	$65	$85	$130	$175	$145	$200	$280	$295	$340	$430	$555

Required Information	Example	#1	#2	#3	#4	#5	#6
Reason: "N"=New or "F"=Failed	N						
Location: Building and Room	North Pump						
Function: Fan, Pump	Pump						
Synchronous Belt Manufacturer	ABC						
Synchronous Belt Model Number	GH553						
Motor Size in Horsepower	5						
Motor Speed in RPM	1800						
Motor Efficiency	94.20%						
Annual Run Hours (actual)	5000						
Quantity	1						
Participant Incentive ($/Synchronous Belt)	$40						
Total Participant Incentive	**$40**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Note: The Eligible Measures Lists and Eligible Measures Worksheets are based on assumptions and are subject to change and the incentive amouts do not include HST or other applicable taxes.

TOTAL PARTICIPANT INCENTIVE REQUESTED:	**$0.00**

Name of Applicant: _____

Company Name: _____

Building Address: _____

_____

mtecorp.com

SineWave Guardian™

Best-in-class SineWave Filter for cleaning PWM waveforms out to 15,000 ft

- **Increases motor life**
- **Easy to integrate, install and service**
- **Operates in high ambient temperatures**
- **High performance and reliability**
- **Three-year warranty**

For motor protection, there is nothing better.

Motor protection and power quality don't have to be a mystery. MTE makes it easy. Case in point: our SineWave Guardian™ Filter. This best-in-class filter delivers unequaled performance in cleaning the PWM waveforms generated by Variable Frequency Drives (VFDs). It virtually eliminates high frequency content and voltage peaks, thereby reducing motor heating to give you extended motor life – and less downtime. The SineWave Guardian also offers incredible reliability and durability. It is more efficient and tolerates higher ambient temperatures, making it ideal for a variety of applications from steel mills to oil fields. Its modular design and smaller footprint make it easier to integrate and install. It all adds up to the best SineWave Filter, and the best value on the market today.

MTE

POWER QUALITY. SOLVED.

Improve efficiency, improve motor life, and improve your bottom line with our new SineWave Guardian™.

MP Motor Protection

SineWave Guardian™ Filters transform the output of Variable Frequency Drives (VFDs) to a near perfect sinusoidal waveform for the best level of motor protection. MTE's unique, patent-pending design offers high performance with smaller size and better efficiency than traditional LC Filters.

Increase motor life: Reduce motor heating through reduction of high frequencies associated with VFD output and also reduce motor insulation stress through reduction of motor peak voltages.

Reduce motor audible noise: Reduce audible noise through reducing high frequencies associated with VFD output.

Reduce radiated emissions: Reduce emissions through reducing high frequencies associated with VFD output.

Protect your motor cable: The reduction of high frequencies associated with VFD output eliminates the need for special motor cables.

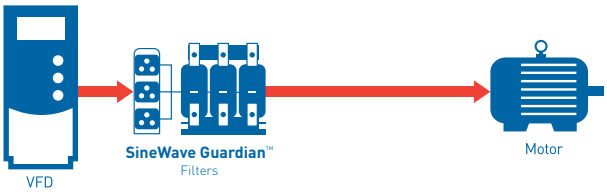
Preliminary Performance Specifications

Service Load Condition	**Conventional 3 phase motors Standard step-up transformer optional**
Input Voltage	**380V - 480V +/- 10%**
Current Range	**2A - 1500A (.75 HP - 1200 HP)**
Harmonic Voltage Distortion	**5% maximum @ 2kHz**
Inverter Switching Frequency	**2kHz to 8kHz**
Inverter Operating Frequency	**6Hz to 75Hz; >75Hz to 120Hz with derating**
Maximum Ambient Temperature	**-40C to +60C modular filter -40C to +55C enclosed filter -40C to +90C storage**
Insertion Loss (Voltage)	**6% maximum @ 60Hz**
Efficiency	**>98%**
Altitude Without Derating	**3,300 feet above sea level**
Maximum Motor Lead Length	**15,000 feet**
Relative Humidity	**0% to 95% non-condensing**
Current Rating	**100% RMS continuous; 150% for 1 minute intermittent**

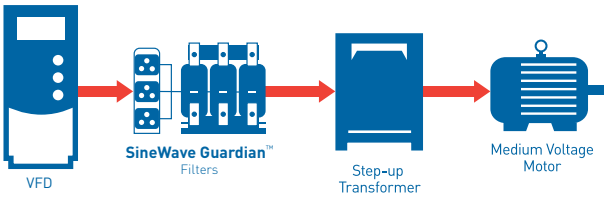
Final product specifications subject to change at anytime.

SineWave Guardian™

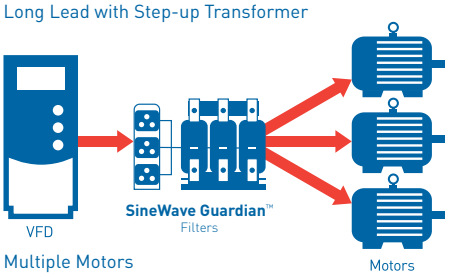
Application Configurations:



Extreme Long Lead to Motor

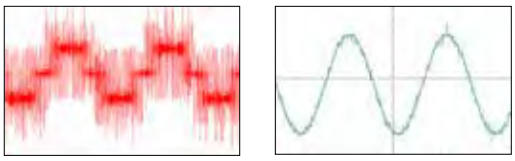


Long Lead with Step-up Transformer



Multiple Motors

SineWave Guardian Performance:



Without SineWave Guardian | With SineWave Guardian

The SineWave Guardian is a SineWave Filter which protects motors from damage by "cleaning" the sinewave waveform that is generated by the Variable Frequency Drive.

MTE Corporation
N83 W13330 Leon Road
Menomonee Falls WI 53051
(800) 455-4MTE • (262) 253-8200

MTE POWER QUALITY. SOLVED.

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