

Better Technology. Better Filters.

Power semiconductor advances are driving conventional filter technology to obsolescence. Traditional laminated silicon-steel filters are struggling to meet the additional demands required by these devices. Compared to conventional technology, **SWF Sine Wave Filters** offer...

- **EXTENDED SYSTEM LIFE** for your AC drive, step-up transformer, and induction motor
- **BETTER MOTOR PROTECTION** for motor windings and bearings
- **HIGHER RELIABILITY** due to cooler, more efficient filter operation
- **HALF THE SIZE & WEIGHT** for a smaller footprint and easier integration and installation
- **NO COST PREMIUM**



CTM Sine Wave Filters - The Future Starts Here

Half the size. Half the weight. Twice the efficiency.

CTM Sine Wave Filters transform the output of Variable Frequency/Speed Drives (VFDs or VSDs) from a Pulse-Width Modulated (PWM) square wave with voltage spikes and high frequency harmonics to a near perfect sinusoidal waveform. The largest companies in the world rely on CTM technology, with more than 200,000 installed units in some of the harshest environments on the planet.

INCREASE ...

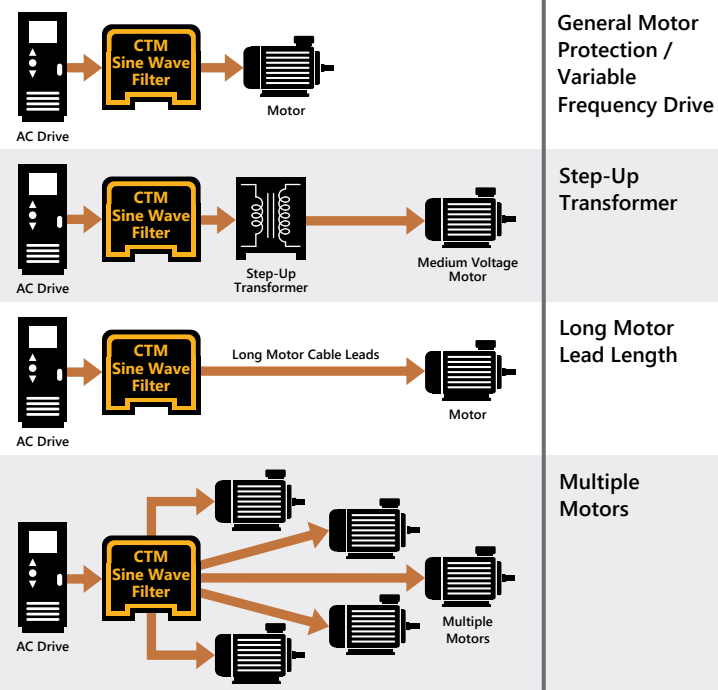
- **Motor Life:** Harmful square waves, voltage spikes, high frequency distortion, and common-mode noise are all filtered from the PWM drive's output, reducing motor heating, bearing currents (fluting) and stress, thereby extending motor longevity.
- **Motor Drive Life:** CTM filters reduce the VFD workload by 6% or more, significantly extending the drive's life.
- **Filter Reliability:** CTM filters maintain lower temperatures, increasing life and reliability.
- **Step-Up Transformer Life:** With a fraction of the insertion loss (voltage drop), S2F Sine Wave Filters allow the step-up transformer to operate at a lower voltage ratio, substantially reducing transformer stress.
- **Power Density:** Our exclusive NEMA 3R Pedestal Cabinet (displayed to the right) offers the highest power density available on the market.



Pedestal Cabinet option displayed above.

The **Pedestal Cabinet** integrates directly below your existing drive cabinet, maximizing power density and reducing system complexity.


Filter Applications



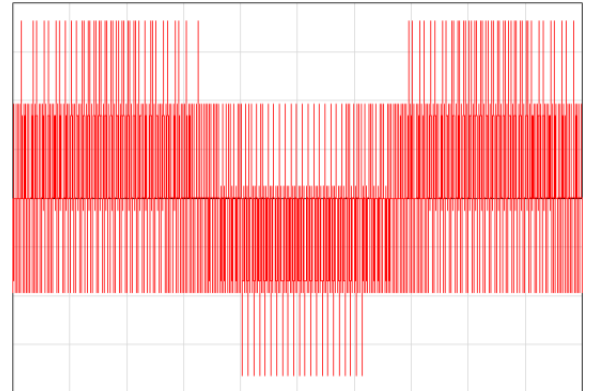
DECREASE ...

- **Power Loss:** Due to its unique patented design and proprietary materials, CTM Sine Wave Filters operate at higher efficiencies than conventional filter technology, decreasing power loss, minimizing dissipated heat, and reducing total cost of ownership.
- **Electric Fluting (Bearing Current):** Common-mode (bearing) current can have disastrous effects on induction motors, leading to electric fluting and premature bearing failure. CTM offers the only sine wave filters with built-in common-mode current mitigation.
- **Design Footprint:** At half the size and weight of laminated silicon-steel technology, CTM filters take up less space and are easier to integrate into existing systems.

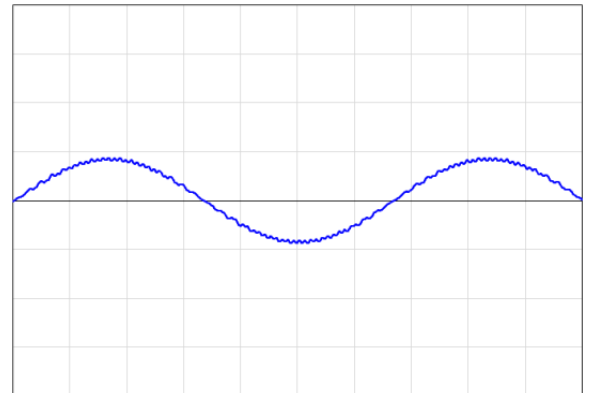
PERFORMANCE SPECIFICATIONS

Nominal Operating Voltage	480 V
Motor Frequency	6 - 90 Hz (up to 120 Hz with de-rating) - For up to 200 Hz applications, see S2F Series Sine Wave Filters
Switching Frequency	2 - 5 kHz
Current Range	130 - 1,440 A
Estimated Motor HP Range	100 - 1,200 HP
Overload Capability	150% rated current for 1 minute
Maximum Ambient Temperature	50°C (122°F) (higher with de-rating)
Harmonic Voltage Distortion	<1.5% with 12% THD input
Insertion Loss (Voltage Drop)	<3.3% @ 60 Hz
Motor Cable Length	15,000 ft or more
Enclosure Options	<ul style="list-style-type: none"> • Open Panel • Stand-Alone Cabinet (NEMA 3R) • Pedestal Cabinet (NEMA 3R) - Maintains NEMA 4 VSD rating
Agency Recognitions	 US 1446

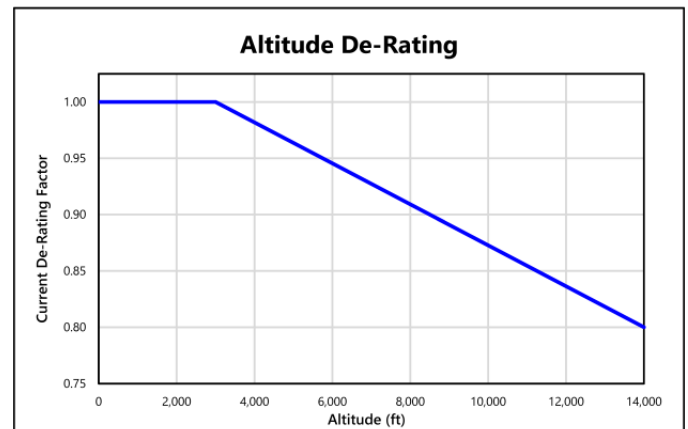
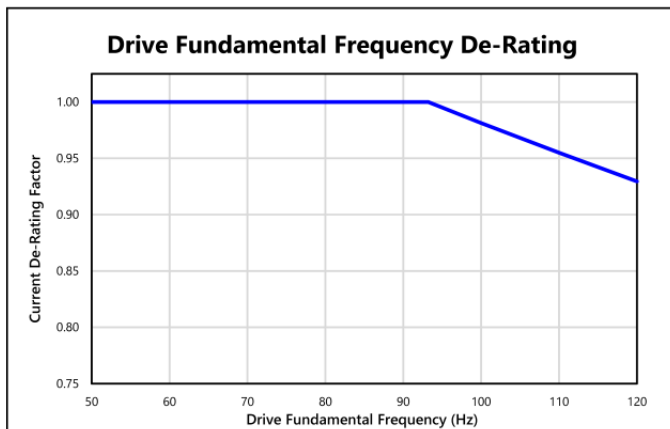
Without CTM Sine Wave Filter (Pulse-Width Modulated Signal)



With CTM Sine Wave Filter ("Cleaned" Sinusoidal Waveform)



De-Rating Curves



Note: Information is for reference only. Data subject to change without notice.

SELECTION TABLES:

Open Panels

Size filters based on the Full Load Amps (FLA) of the motor. The filter current rating must be less than or equal to the FLA. Order filters by [CTM Part Number](#) online at ctmmagnetics.com/contact-us, or call us directly at [480.967.9447](tel:480.967.9447).



Rated Current (A _{RMS})	Est. Motor HP ¹	Power Loss (Watts)		OPEN PANEL		
		@ 60 Hz	12% THD ²	Part Number ³	Size (in) (H X W X D)	Weight (lbs)
130	100	465	489	SWF0130A00	24.0 X 24.0 X 15.3	151
200	150	849	909	SWF0200A00	24.0 X 24.0 X 15.3	181
240	200	903	963	SWF0240A00	24.0 X 24.0 X 15.3	182
300	250	831	894	SWF0300A00	24.9 X 25.0 X 16.8	232
360	300	1,083	1,179	SWF0360A00	26.9 X 27.0 X 18.0	285
420	350	1,161	1,263	SWF0420A00	26.9 X 27.0 X 18.0	313
480	400	1,302	1,422	SWF0480A00	26.9 X 27.0 X 18.0	337
540	450	1,332	1,461	SWF0540A00	26.9 X 27.0 X 18.0	333
600	500	1,365	1,497	SWF0600A00	28.9 X 29.0 X 19.4	376
720	600	1,608	1,767	SWF0720A00	28.9 X 29.0 X 19.4	422

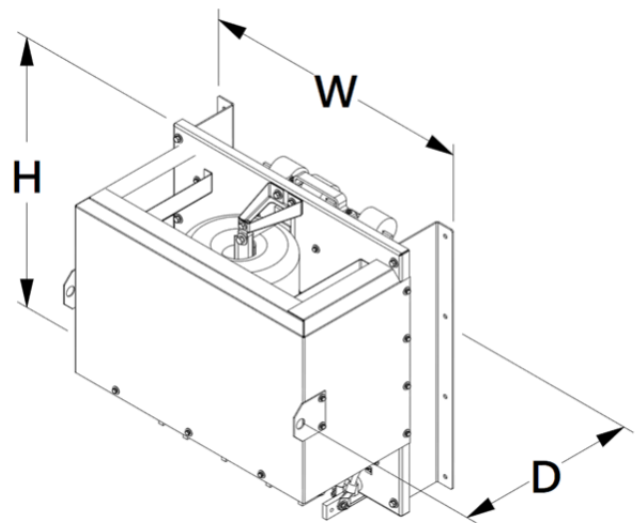
¹ Motor HP estimated based on typical conditions. Actual HP will vary with application. Size filter based on motor FLA.

² Based on 60 Hz output frequency and 12% THD at the minimum switching frequency.

³ Use [Part Number System \(page 7\)](#) to select options. Unspecified options will be assumed to carry the default "-0000" option number.

With a compact design, CTM Open Panels easily integrate within an AC drive enclosure, or can be designed into a new product.

- **Compact Form Factor** for design into existing cabinets
- **Lowest Cost Solution** with no additional enclosure requirements
- **Highest Power Density** when compared to other enclosure solutions



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SELECTION TABLES: Stand-Alone Cabinets, NEMA 3R



Size filters based on the Full Load Amps (FLA) of the motor. The filter current rating must be less than or equal to the FLA. Order filters by [CTM Part Number](#) online at ctmmagnetics.com/contact-us, or call us directly at [480.967.9447](tel:480.967.9447).

Rated Current (A _{RMS})	Est. Motor HP ¹	Power Loss (Watts)		NEMA 3R Stand-Alone Cabinet		
		@ 60 Hz	12% THD ²	Part Number ³	Size (in) (H X W X D)	Weight (lbs)
130	100	465	489	SWF0130AS3	43.3 X 29.0 X 28.7	265
200	150	849	909	SWF0200AS3	43.3 X 29.0 X 28.7	295
240	200	903	963	SWF0240AS3	43.3 X 29.0 X 28.7	296
300	250	831	894	SWF0300AS3	43.3 X 29.0 X 28.7	346
360	300	1,083	1,179	SWF0360AS3	43.3 X 29.0 X 28.7	399
420	350	1,161	1,263	SWF0420AS3	43.3 X 29.0 X 28.7	427
480	400	1,302	1,422	SWF0480AS3	43.3 X 29.0 X 28.7	451
540	450	1,332	1,461	SWF0540AS3	43.3 X 29.0 X 28.7	447
600	500	1,365	1,497	SWF0600AS3	43.3 X 29.0 X 28.7	490
720	600	1,608	1,767	SWF0720AS3	43.3 X 29.0 X 28.7	536
840	700	2,322	2,526	SWF0840AS3	51.3 X 61.3 X 34.6	1,141
960	800	2,604	2,844	SWF0960AS3	51.3 X 61.3 X 34.6	1,190
1,080	900	2,664	2,922	SWF1080AS3	51.3 X 61.3 X 34.6	1,182
1,200	1,000	2,730	2,994	SWF1200AS3	51.3 X 61.3 X 34.6	1,273
1,440	1,200	3,216	3,534	SWF1440AS3	51.3 X 61.3 X 34.6	1,365

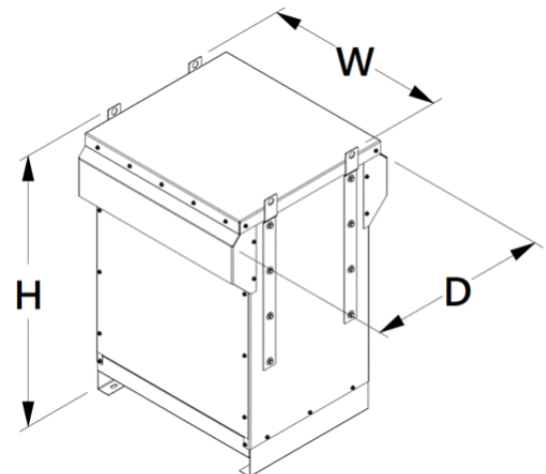
¹ Motor HP estimated based on typical conditions. Actual HP will vary with application. Size filter based on motor FLA.

² Based on 60 Hz output frequency and 12% THD at the minimum switching frequency.

³ Use [Part Number System \(page 7\)](#) to select options. Unspecified options will be assumed to carry the default "-0000" option number.

CTM Stand-Alone Cabinets provide drop in place solutions with environmental protection.

- **NEMA 3R** rating provides protection from the elements, including rain, snow, and dust
- **Drop In Place Solution** allows easy integration into existing motor control systems
- **Up to 1,500 Amps** with largest cabinet



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SELECTION TABLES:

Pedestal Cabinets, NEMA 3R

Size filters based on the Full Load Amps (FLA) of the motor. The filter current rating must be less than or equal to the FLA. Order filters by [CTM Part Number](#) online at ctmmagnetics.com/contact-us, or call us directly at [480.967.9447](tel:480.967.9447).



Rated Current (A _{RMS})	Est. Motor HP ¹	Power Loss (Watts)		NEMA 3R Drive-Integrated Pedestal Cabinet		
		@ 60 Hz	12% THD ²	Part Number ³	Size (in) (H X W X D)	Weight (lbs)
130	100	465	489	SWF0130AP3	17.9 X 25.1 X 28.1	273
200	150	849	909	SWF0200AP3	17.9 X 25.1 X 28.1	304
240	200	903	963	SWF0240AP3	22.4 X 40.6 X 38.5	423
300	250	831	894	SWF0300AP3	22.4 X 40.6 X 38.5	473
360	300	1,083	1,179	SWF0360AP3	22.4 X 40.6 X 38.5	526
420	350	1,161	1,263	SWF0420AP3	22.4 X 40.6 X 38.5	558
480	400	1,302	1,422	SWF0480AP3	22.4 X 40.6 X 38.5	583
540	450	1,332	1,461	SWF0540AP3	22.4 X 40.6 X 38.5	579
600	500	1,365	1,497	SWF0600AP3	23.4 X 54.8 X 38.5	689
720	600	1,608	1,767	SWF0720AP3	23.4 X 54.8 X 38.5	739
840	700	2,322	2,526	SWF0840AP3	23.4 X 54.8 X 38.5	965
960	800	2,604	2,844	SWF0960AP3	23.4 X 54.8 X 38.5	1,013
1,080	900	2,664	2,922	SWF1080AP3	23.4 X 54.8 X 38.5	1,006
1,200	1,000	2,730	2,994	SWF1200AP3	23.4 X 78.8 X 38.5	1,247
1,440	1,200	3,216	3,534	SWF1440AP3	23.4 X 78.8 X 38.5	1,347

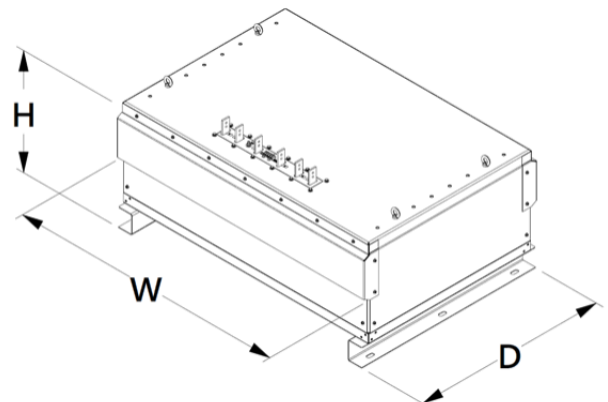
¹ Motor HP estimated based on typical conditions. Actual HP will vary with application. Size filter based on motor FLA.

² Based on 60 Hz output frequency and 12% THD at the minimum switching frequency.

³ Use [Part Number System \(page 7\)](#) to select options. Unspecified options will be assumed to carry the default "-0000" option number.

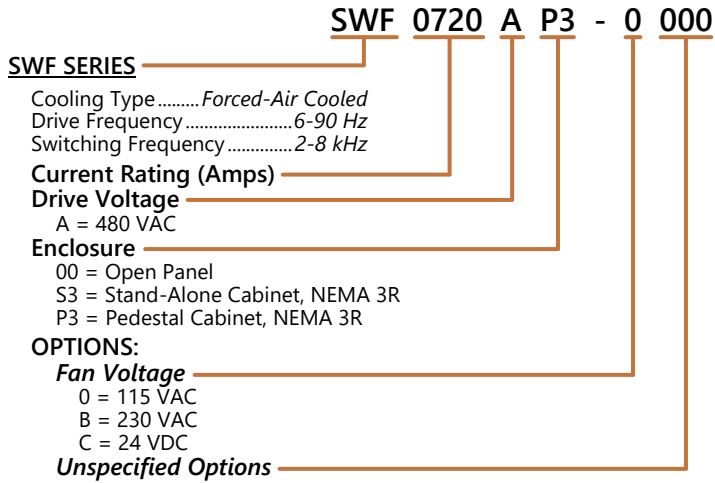
By integrating a sine wave filter Pedestal Cabinet with a variable speed drive (VSD) cabinet, CTM has simplified the entire motor control system.

- **Single, Integrated Product** for easy shipping and field installation
- **Maximized Power Density** by minimizing design footprint
- **Reduced System Complexity** by minimizing external power connections and auxiliary cabinets
- **Maintain Existing VSD Protection Rating** with a sealed, NEMA 4 compatible gland plate.
- **Single Supply Chain** delivering tested sine wave filter cabinet to final VSD assembly
- **NEMA 3R** protection rating



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Part Numbering System



Stand-Alone Cabinets



130-750 A

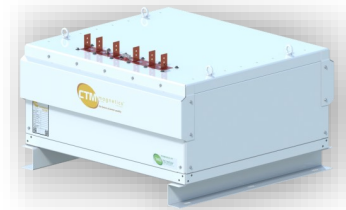


840-1,440 A

Pedestal Cabinets



130-200 A



240-540 A



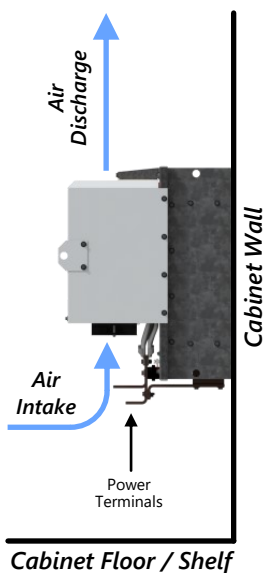
600-1,080 A



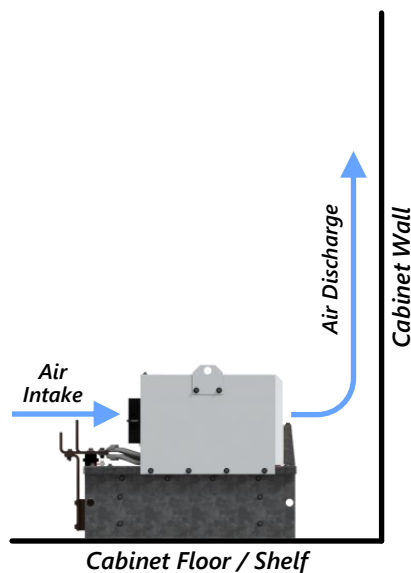
1,200-1,440 A

Panel Mounting Arrangements

Vertical Mount



Chassis Mount



Note: Figures are for reference only.

Total System Reliability

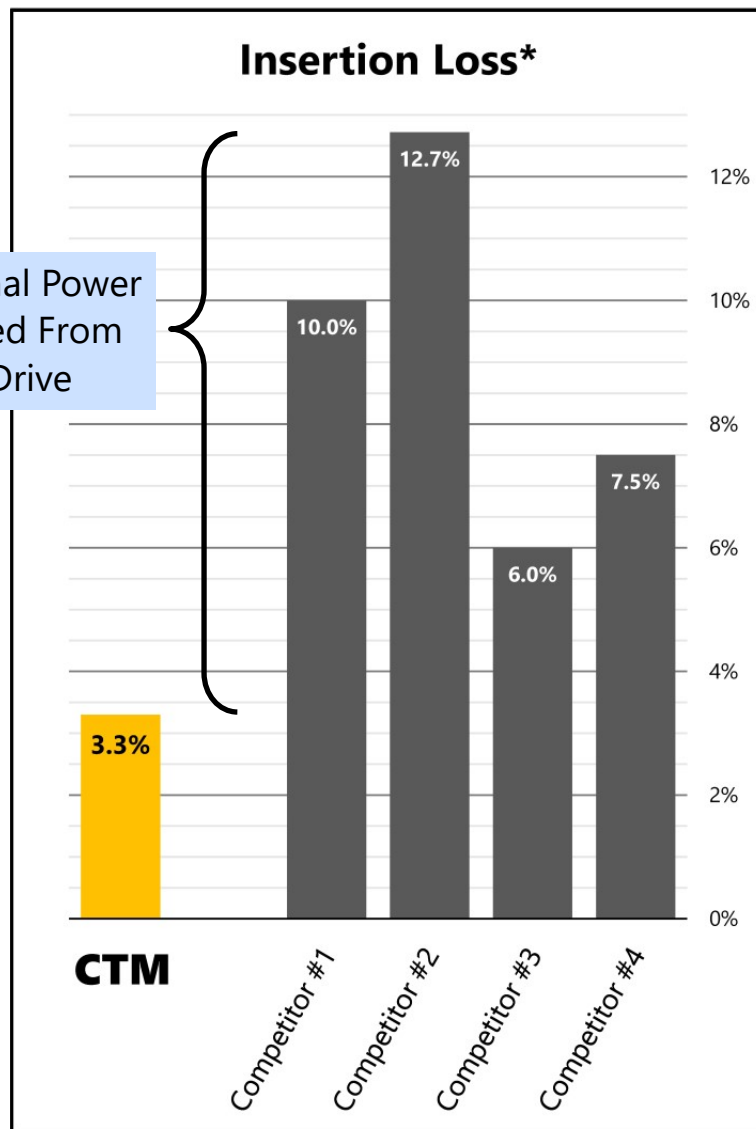
Sine wave filter efficiency directly equates to system reliability; the more efficient the filter, the more reliable the AC drive and any transformers.

AC Drive Reliability

Insertion loss is a system specification which measures the drop in available power (at the motor) caused by inserting a filter into the system.

In order to overcome insertion loss, the AC drive must output at higher current and/or voltage (greater than the insertion loss %). This additional demand places additional stress on the AC drive, significantly reducing drive reliability and longevity.

As can be seen in the graph on the right, CTM filters provide markedly lower insertion loss than the four main competitors. By minimizing the insertion loss, **CTM Sine Wave Filters greatly increase the reliability of the AC drive.**



* Insertion loss values from latest competitor product datasheets



Additional information is available online from the following sources:
[SWF Line Frequency Sine Wave Filters](#)
[S2F High Frequency Sine Wave Filters](#) (for up to 200 Hz applications)
ctmmagnetics.com

Contact us online at:

ctmmagnetics.com/contact-us

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Final product specifications subject to change