



FLEXSINE™ 120

Air Cooled Sine Wave Filters

6 - 120 Hz

Selection Brochure | S120F Sine Wave Filters

Buy for Today.
Prepare for Tomorrow.

One Filter
Induction and PM Motors
No Derate

- **Single Filter:** 60 Hz to 180 Hz motor
- **Stop Derating VFD** for PM Motors
- **Stop Derating Filter** for PM Motors
- **Stop Compromising:** lower cost solutions are here

Stop Trying to Make Silicon Steel “Work”...

Motor advances are driving the market to switch to faster spinning PM motors. These higher speeds lead to high frequency harmonic distortion at the output of the drive. Our competitors' filters overheat under this additional stress, forcing them to derate their filters. Furthermore, competitors often demand higher drive switching frequencies (to decrease THID), which then requires a drive derating.

FLEXSINE 120 HIGHLIGHTS

Single Design for IM and PM Motor Operation

The FlexSine 120 is the only sine wave filter designed specifically for operation with today's 60 Hz induction motor applications as well as tomorrow's high frequency permanent magnet (PM) motors.

Avoid Equipment Derating At High Frequency

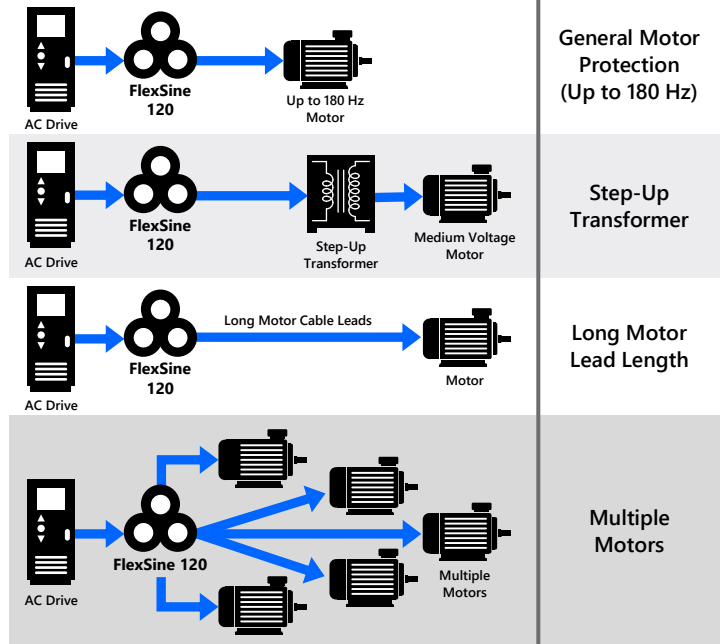
Competitors' solution to high frequency PM motors is to force you to buy a larger filter and switch the VFD at 5 kHz. Not only are you forced to pay more for the larger filter, the 5 kHz switching frequency derates the drive, increasing up-front costs further by requiring a larger drive.

The FlexSine 120 is different. Due to a unique patented design and proprietary materials, the FlexSine 120 allows you operate at 2.5 kHz, avoiding any drive derate. The FlexSine 120 also is rated at full current up to 120 Hz (up to 180 Hz with 0-15% derate).

Upgrade to PMM with Existing Equipment

The FlexSine 120 allows you to use your current drive to upgrade to PMM frequencies. Simply switch out your existing sine wave filter with an appropriately sized FlexSine filter to start reaping the benefits of PMM.

FILTER APPLICATIONS




General Motor Protection
(Up to 180 Hz)

Step-Up Transformer

Long Motor Lead Length

Multiple Motors

PERFORMANCE SPECIFICATIONS

Harmonic Distortion	<5% THVD @ 2.5 kHz
Voltage Range	Up to 500 V
Fundamental Frequency	6 - 120 Hz (Up to 180 Hz with derating)
Switching Frequency *	2.5 kHz Nominal 2.0 kHz Minimum (See FlexSine 120 Operating Range Chart)
Current Range	100 - 960 A
Overload Capability	150% rated current for 1 minute
Maximum Ambient Temperature	50 °C (122 °F) (Higher with derating)
Motor Cable Length	Up to 15,000 feet
Enclosure Options	Modular Panel Integrated Panel NEMA 3R Cabinet
Agency Recognitions	 1446 Standard

* Thermal design to 2.0 kHz. Contact CTM for application verification.

CTM SINE WAVE FILTERS

Stop Rewinding Motors

Harmful square waves, voltage spikes, and harmonic distortion are all filtered from the inverter output, reducing motor heating, wear, and winding stress, providing critical motor protection. Additionally, dV/dt reduction allows longer motor lead lengths (up to 15,000 feet). How much does it cost to rewind?

No Common Mode Noise

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 that do not introduce common-mode currents.

High-Reliability Capacitors

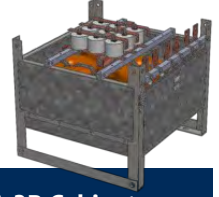
CTM sine wave filters utilize high-reliability capacitors. Compared to the electrolytic capacitors used in competitors' filters, CTM capacitors have higher capacitance stability with temperature, higher surge voltage ratings, and are low ESR for higher ripple current handling. Additionally, CTM capacitors are self-healing. All of these factors lead to boosts in system reliability and longevity.

100% Load at Cold-Start (Automatic Restart)

Electrolytic caps have high ESR at lower temperature. Hence, in cold environments, they require time to heat up during start/restart. If this procedure is not followed, electrolytic caps will fail. On the other hand, CTM's capacitors are ready for 100% load at all temperatures, leading to quick cold-starts and restarts.

ELECTRICAL AND MECHANICAL SPECIFICATIONS:

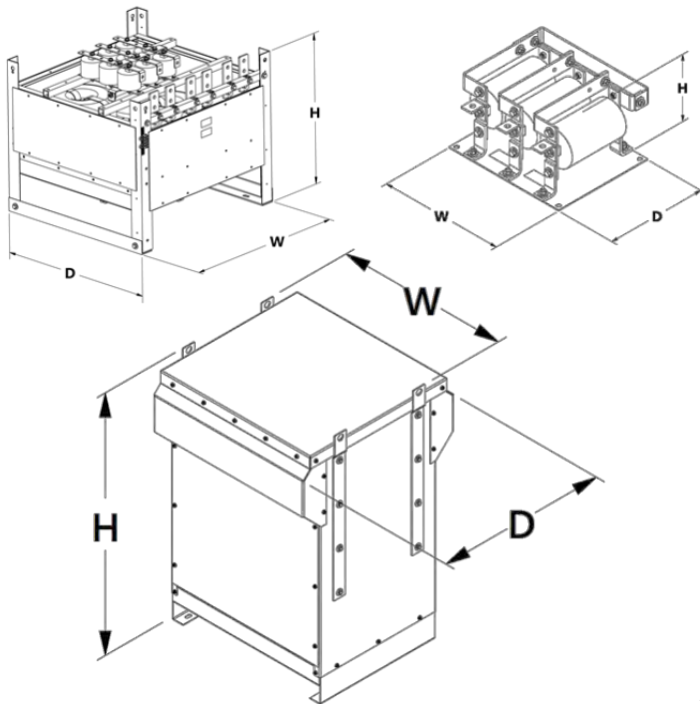
Size filter based on the Full Load Amps (FLA) of the drive. The filter current rating must be greater than or equal to the FLA. Order filters by CTM Part Number online at ctmmagnetics.com/contact-us, or call us directly at [480.967.9447](tel:480.967.9447).



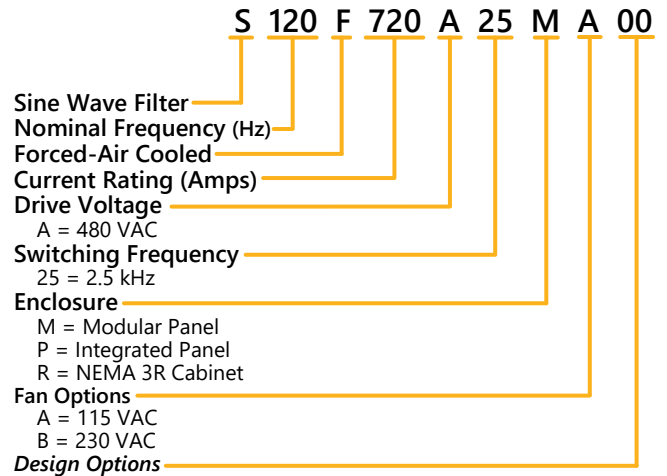
Rated Current (A _{RMS})	Est. Motor HP ¹	Fund. Frequency Derating		Modular Panel			Integrated Panel			NEMA 3R Cabinet			
		150 Hz	180 Hz	Part Number ²	Size (W x D x H)		Weight (lb)	Part Number ²	Size (W x D x H) (in)	Weight (lb)	Part Number ²	Size (W x D x H) (in)	Weight (lb)
					Reactor (in)	Cap. Panel (in)							
100	75	100%	95%	S120F100A25MA00	19.0 x 19.0 x 17.0	11.0 x 8.9 x 5.9		S120F100A25PA00	19.0 x 19.0 x 23.0		S120F100A25RA00	21.0 x 35.0 x 35.5	
130	100	100%	95%	S120F130A25MA00	19.0 x 19.0 x 17.0	11.0 x 8.9 x 5.9		S120F130A25PA00	19.0 x 19.0 x 23.0		S120F130A25RA00	21.0 x 35.0 x 35.5	
160	125	95%	90%	S120F160A25MA00	19.0 x 19.0 x 17.0	11.0 x 8.9 x 5.9		S120F160A25PA00	19.0 x 19.0 x 23.0		S120F160A25RA00	21.0 x 35.0 x 35.5	
200	150	100%	95%	S120F200A25MA00	19.0 x 19.0 x 17.0	11.0 x 9.5 x 5.9		S120F200A25PA00	19.0 x 19.0 x 23.0		S120F200A25RA00	21.0 x 35.0 x 35.5	
240	200	100%	95%	S120F240A25MA00	19.0 x 19.0 x 17.0	11.0 x 9.5 x 5.9		S120F240A25PA00	19.0 x 19.0 x 23.0		S120F240A25RA00	21.0 x 35.0 x 35.5	
300	250	95%	90%	S120F300A25MA00	19.0 x 19.0 x 17.0	11.0 x 8.9 x 12.1		S120F300A25PA00	19.0 x 19.0 x 23.0		S120F300A25RA00	21.0 x 35.0 x 35.5	
360	300	100%	100%	S120F360A25MA00	21.0 x 21.0 x 19.0	11.0 x 8.9 x 12.1		S120F360A25PA00	21.0 x 21.0 x 25.0		S120F360A25RA00	24.0 x 37.0 x 37.5	
420	350	100%	90%	S120F420A25MA00	21.0 x 21.0 x 19.0	11.0 x 9.5 x 8.6		S120F420A25PA00	21.0 x 21.0 x 25.0		S120F420A25RA00	24.0 x 37.0 x 37.5	
480	400	90%	85%	S120F480A25MA00	21.0 x 21.0 x 19.0	11.0 x 9.5 x 8.6		S120F480A25PA00	21.0 x 21.0 x 25.0		S120F480A25RA00	24.0 x 37.0 x 37.5	
540	450	95%	90%	S120F540A25MA00	26.9 x 25.6 x 21.0	11.0 x 9.5 x 8.6		S120F540A25PA00	26.9 x 25.6 x 27.1		S120F540A25RA00	29.3 x 42.6 x 39.5	
600	500	95%	85%	S120F600A25MA00	26.9 x 25.6 x 21.0	11.0 x 9.5 x 12.1		S120F600A25PA00	26.9 x 25.6 x 27.1		S120F600A25RA00	29.3 x 42.6 x 39.5	
720	600	100%	90%	S120F720A25MA00	26.9 x 25.6 x 21.0	11.0 x 9.5 x 12.1		S120F720A25PA00	26.9 x 25.6 x 27.1		S120F720A25RA00	29.3 x 42.6 x 39.5	
840	700	100%	95%	S120F840A25MA00	26.9 x 25.6 x 21.0	21.5 x 9.5 x 8.6		S120F840A25PA00	26.9 x 25.6 x 27.1		S120F840A25RA00	29.3 x 42.6 x 39.5	
960	800	95%	90%	S120F960A25MA00	26.9 x 25.6 x 21.0	21.5 x 9.5 x 8.6		S120F960A25PA00	26.9 x 25.6 x 27.1		S120F960A25RA00	29.3 x 42.6 x 39.5	

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

² Use part number table (bottom right) for additional options.

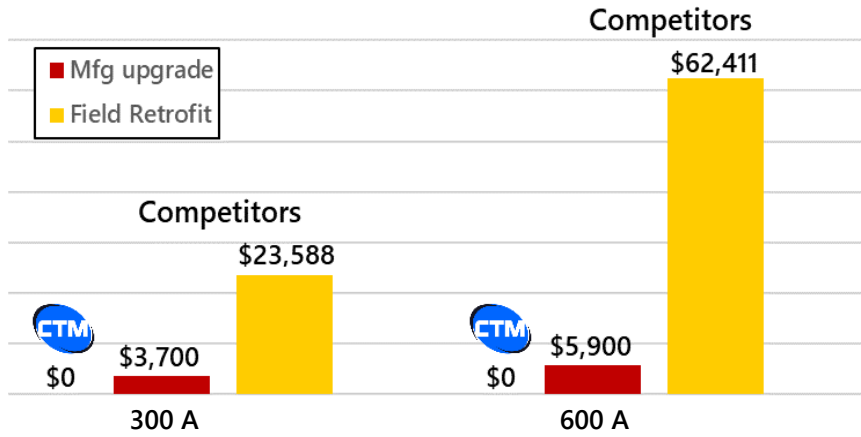


Part Number System



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

COST TO UPGRADE TO 120 Hz



■ Manufacturing upgrade is based on 25% filter and 20% VFD derate to achieve 120 Hz.
 ■ Field retrofit estimate requires a new filter and new VFD to meet full power based on derate above.

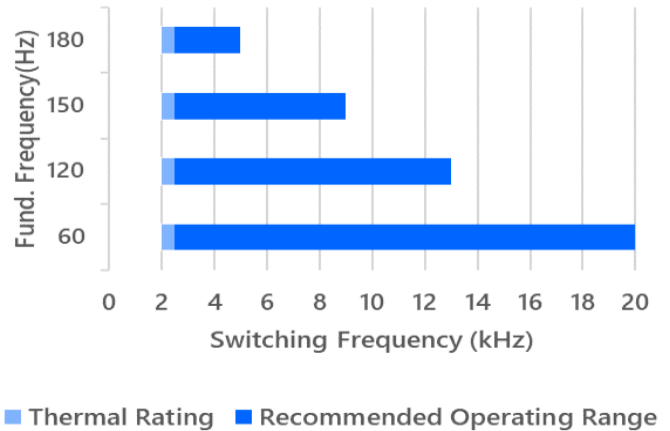
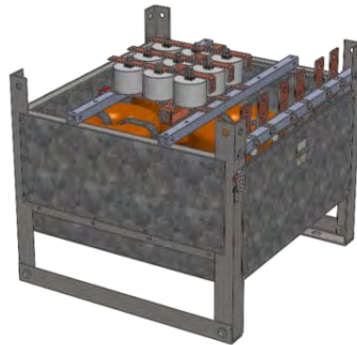
Following our competitor recommendations, upgrading to 120 Hz can be a costly endeavor, with filter derating of at least 25% and drive derating of at least 20% (due to the recommended 5 kHz switching frequency). These recommendations become even more costly with field retrofits, as the drive and filter are essentially scrapped.

However, there is another option. By installing a CTM FlexSine 120 filter now, you not only get the benefits of a low cost 60 Hz sine wave filter, you also unlock the ability to upgrade to a 120 Hz PM motor at no additional cost, whether that is an initial or future plan. Buy for today, be prepared for tomorrow.

FLEXSINE 120 OPERATING RANGE

The FlexSine 120 product line is electrically designed to provide -17 dB attenuation at a switching frequency of 2.5 kHz. The product line is thermally designed to operate at 120 Hz and minimum 2 kHz switching frequency. The chart to the right displays the maximum switching frequencies at various fundamental frequencies.

With an operating switching frequency of 2.0 kHz the attenuation drops to -12.4 dB and allows for more harmonic distortion at the output of the filter. It is up to the customer to determine if this is an appropriate amount of filtering



Scan for CTM Contact Information:



Additional information is available online:

ctmmagnetics.com

Contact us online at:

ctmmagnetics.com/contact-us

Final product specifications subject to change