

Solution Profile



Designed for HVAC-R Cooling Applications

Solving EC motor harmonics and achieving power savings

What are EC Motors (ECMs)?

An electronically commutated motor (ECM) includes a special controller that acts like a small Variable Frequency Drive (VFD) to regulate the motor's speed. This controller-motor package assures that the motor runs at optimal efficiency for demand.

Harmonic Issues & Mitigation

ECMs are used primarily in the HVAC-R industry. Their main use is to control fan speeds in air handling units and fan walls, especially in data centers.

Because an ECM emulates a VFD, it creates harmonics that "pollute" the power supply. These harmonics require mitigation to maintain strong power quality on the electric grid.

MTE's Matrix Air uses a patented design to reduce harmonics and has low insertion losses of less than 5%. Other solutions only offer 7%.

Matrix Air also provides greater stability across the speed ranges which allows each fan to operate at full speed at higher efficiencies. Every application is

Benefits of filtering ECM harmonics:

- Lower utility costs and IEEE-519 compliance
- Prevents overheating of components
- Reduces equipment malfunction
- Avoids nuisance tripping of circuit breakers

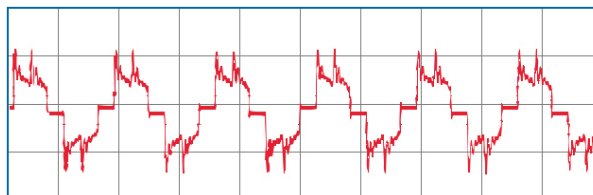
Matrix Air target applications:

- Data center cooling - fans & condenser units
- Variable refrigeration flow equipment
- Refrigerated retail displays
- Conveyor belt motors

unique (type of fans, number of fans, overall load, and controller) so MTE designs a custom solution to meet the requirements for each one. For example, MTE has created 60 Hz and 50 Hz Matrix Air products to meet various specifications.

Power Line Current Graphs

Harmonics without Matrix Air

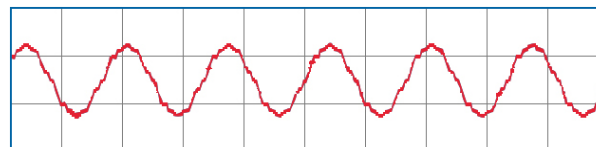


There is significant ECM harmonic distortion without Matrix Air. Note the pointed double-hump spikes at the tops and bottoms of the wave form.

These line side harmonics result in:

- Non-compliance with IEEE-519 standards
- Fines from utilities
- Higher electric bills
- Nuisance tripping of circuit breakers

Harmonics Mitigated with Matrix Air



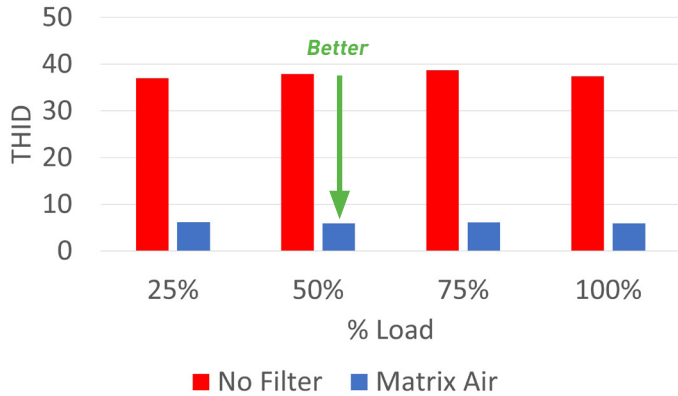
Matrix Air produces a clean, smooth sinewave with no dramatic double-hump spikes. This clean power results in:

- Compliance with IEEE-519 standards
- No fines from utilities
- Lower electric bills
- No tripping of circuit breakers



MTE's Patented Matrix® Air EC Motor Filter Benefits

Over 80% THID Reduction with Matrix Air



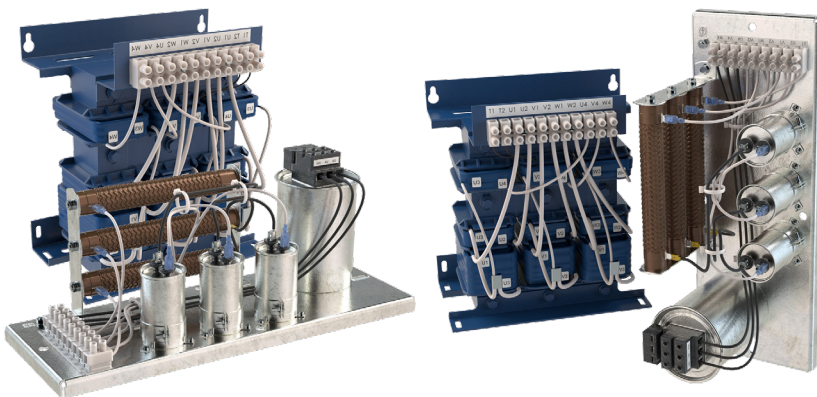
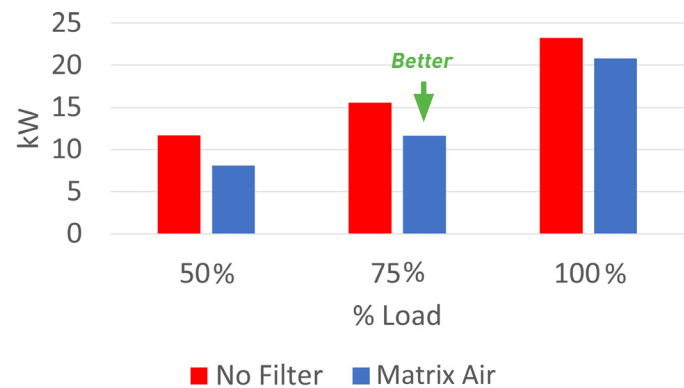
Benefits of Matrix Air's THID Mitigation

- Stability of system across any speed/load
- Reduces Total Harmonic Current Distortion (THID) by more than 80%
- Eliminates transformer derating per ANSI/IEEE C57.110 due to non-linear loads

Improved Power Consumption with Matrix Air

- 20%-30% power savings vs. no filter
- Decreased electrical costs
- Less energy used per unit
- Improved energy efficiency

Up to 30% Energy Savings with Matrix Air



Matrix Air EC Motor Filters

Our Matrix Air lineup utilizes patented designs to meet the needs of EC motor harmonics. Matrix Air reduces harmonic distortion, provides system stability, and provides low insertion losses of 5%. Contact MTE for the best solution for your requirements.

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 Scan QRC for home page.

