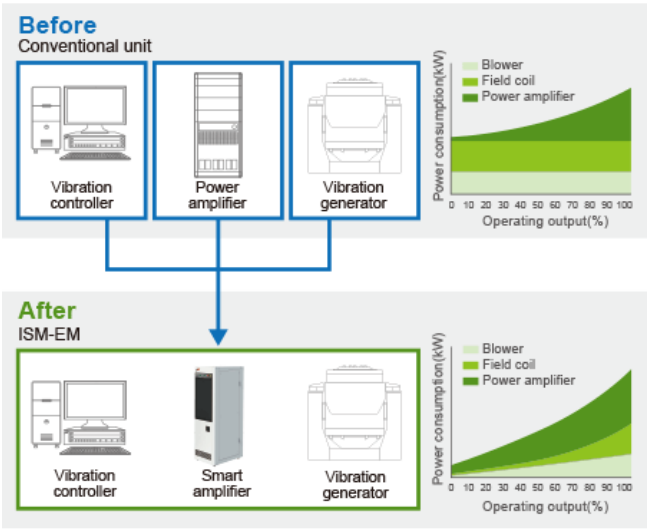
Amplifier Replacement

Electrodynamic shakers consume a lot of energy. IMV has developed super-long life amplifiers with Integrated Shaker Manager (ISM-EM) technology, which:

- ● minimizes the required electric power,
- ● cuts down electric consumption,
- ● reduces blower noise for air-cooled shakers and
- ● is incredibly reliable.

ISM-EM can be adapted for use with shakers from any manufacturer, not just IMV. All you need to do is to upgrade the amplifier and install the software on the computer of the existing vibration controller.



Real automatic energy-saving function

Complicated settings are not necessary.

Lower your noise emissions

Reduce your carbon footprint.

Results of reduced power consumption

With 20% output: **70% reduction.**

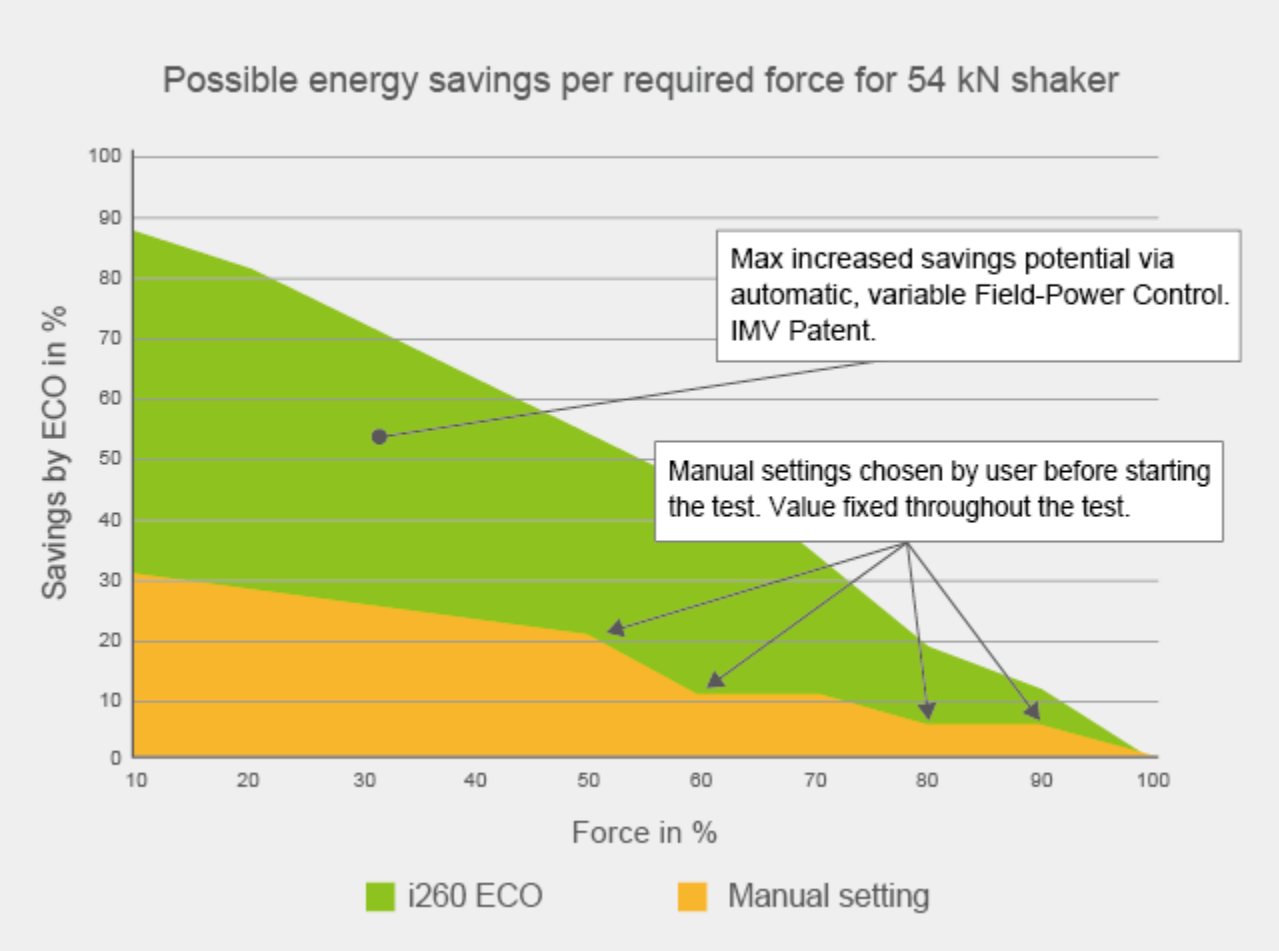
With 40% output: **40% reduction.**

The reduction effects noted above are just an example. Actual results will vary based on the individual system.

Benefits

Operating Cost Savings

Conventional shaker systems set the field power and blower speed to their nominal settings as soon as the system starts up. Only the armature power varies according to the force required for the test.
IMV's ISM-EM technology constantly monitors the force required to execute the vibration test, and by using high-frequency power converters, automatically adjusts the field power and cooling blower speed to run at the point of minimum energy consumption.



Estimation of cost savings:
Using a replacement amplifier for an LDS V870 (7,500 lbf) as an example, we calculated the energy savings depending on output force, assuming 20 days per month of operation and electricity costs of $0.10 per kWh.

Load factor (output/rated force)	Electricity cost savings		
	First year	In 10 years	In 20 years
25% (1,875 lbf)	$10,774	$107,740	$215,480
50% (3,750 lbf)	$9,022	$92,200	$180,440
75% (5,625 lbf)	$6,856	$68,560	$137,120

Increased Durability

The durability of IMV shakers is already well-known in many Asian and European countries. We have installed over 200 multi-axis systems in the world throughout these 20 years, in addition to a large number of single-axis shaker systems. In the United States, we have testimonials from test houses such as Spectrum Technologies, Inc., an automotive test house located in Redford, Michigan. It has 2 simultaneous 3-axis shaker systems (TS-2000-6H, 4,400 force pounds per axis). The first system was installed about 10 years ago and the second was installed in November 2017. Both shaker systems generally run at up to 2,000 Hz for "Big Three" automotive manufacturers' durability tests. The first shaker system has been operating with no downtime at all since its installation, demonstrating IMV's real-world durability. As of September 2020, the hour meter on the amplifier shows 29,543 hours of maintenance-free runtime. The 3-axis systems at Spectrum Tech successfully prove the performance of our 4th generation IGBT technology, recently improved upon even more with our new 5th generation power modules. Please note that IMV amplifiers can operate under an ambient temperature of 104 Fahrenheit (40°C).

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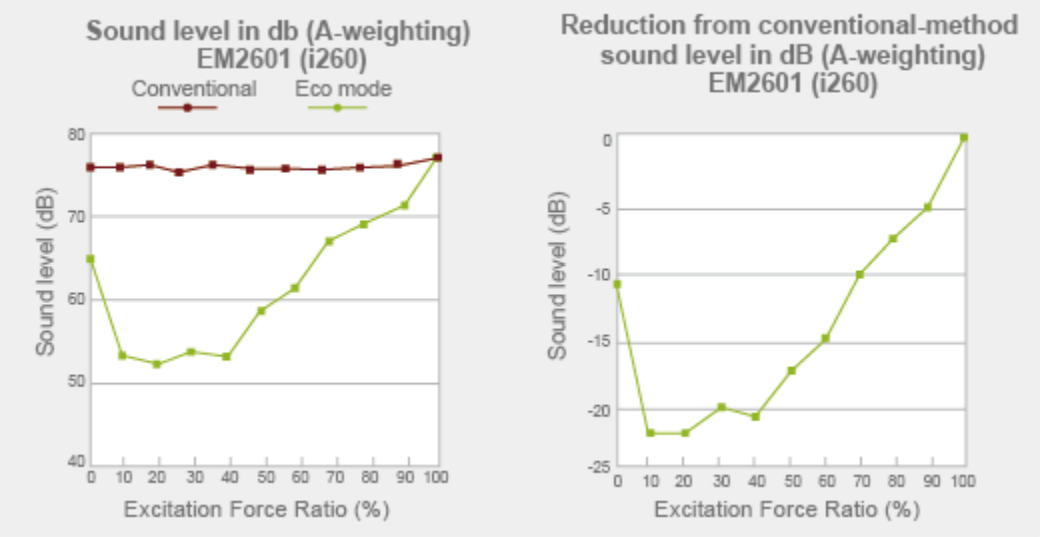
Noise Reduction (for air-cooled models): Quiet Shaker

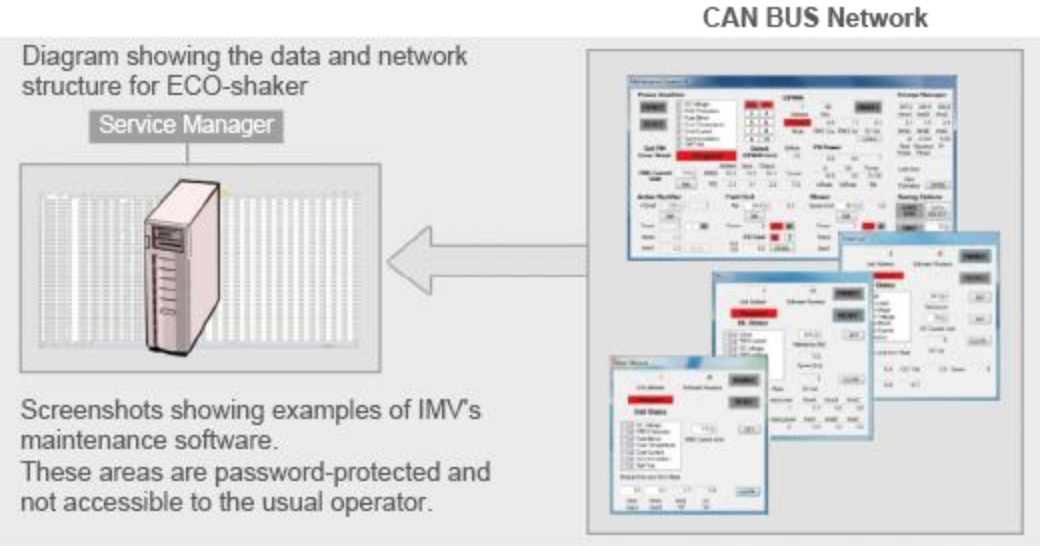
In minimizing the energy used by IMV's ISM-EM software to run any given test, the cooling requirements are also minimized. Not only does this save energy, but it also means that for most tests, the ISM-EM is quiet. Air-cooled shaker systems are sometimes criticized for the blower noise they produce, but IMV's ISM-EM solves this problem. For low force tests, the cooling blower automatically runs at a reduced speed and the total system noise level is much reduced. When the shaker is running at full force, the noise from the shaker table exceeds that of the blower, making blower noise a non-issue. Many of IMV's customers are purchasing the ECO-system for the noise reduction alone, and the energy savings are an additional benefit. The figures below show the measured sound levels of IMV's i260 shaker, which has a rated force of 54 kN (12,100 lbf), when operating in the ECO power-saving mode.



Advanced Service Support/(Remote) Maintenance Manager

IMV's ISM-EM monitors up to 200 parameters, including power module operating conditions, system temperatures, interlock status, controller status, 3-phase supply conditions, and so on. When these parameters are recorded and saved to a log file, the system can run advanced diagnostics. Further, each time a system interlock occurs, a snapshot is taken of the system operating parameters both before and after the occurrence of the interlock. All of this information means that IMV can remotely diagnose a system problem such that:

○ The problem can usually be resolved remotely and the system can get back up and running without the need for a service engineer to visit.○ If a service visit is required, the engineer will bring the correct spare part and have the system running again in only one trip.Everything is done to keep the ISM-EM running at full performance so that you can maximize your return on investment.



ECO TECHNOLOGY

All advantages at a glance

- Reduction of field power to less than 50% without noise from the shaker armature
- Ideal operating point; automatic adjustment of level for field and armature
- Automatic adjustment during test execution
- Optimization without requiring user knowledge of the technology
- Optimization occurs automatically based on the actual parameters of the test
- Automatic switch-off at the end of the test
- Diagnostic options provided in case of error
- Optimization based on performance data
- Field power can be adjusted manually or automatically for increased shock velocity
- Integrated amplifier operation from the vibration controller
- Can also be retrofitted for older shaker models from all manufacturers