AUTOMATIC TRANSFER SWITCHES

TOTAL SYSTEM INTEGRATION
GENERATORS | TRANSFER SWITCHES | SWITCHGEAR | CONTROLS
This isn’t your typical power system, and it isn’t your typical ATS. Because at the heart of your integrated power system is a quality KOHLER® automatic transfer switch. A transfer switch that’s designed by Kohler, built by Kohler and chosen specifically for your power requirements.

Good news: There’s more. Behind that power system is a team of dedicated Kohler engineers that focuses on every element – generator, transfer switch, switchgear and controller – to be sure the system you get is the system you need. You’ll know that your project is supported by an expert team, customized to your exact needs, brought in on budget and on time.

From spec to start-up to service, we do it all.
KOHLER® GENERATOR
Gas generators 25-400 kW
Diesel generators 10-3250 kW

KOHLER AUTOMATIC TRANSFER SWITCH
Open, closed and programmed transition operating modes; standard, bypass-isolation and service-entrance switch configurations

KOHLER REMOTE ANNUNCIATOR
Remote monitoring and testing of transfer switches

KOHLER PARALLELING SWITCHGEAR
Low and medium voltage

KOHLER DECISION-MAKER® CONTROLLERS
Control, monitors and system diagnostics

KOHLER WIRELESS MONITOR
Performance monitoring around the clock

KOHLER MONITORING SOFTWARE
Monitors generators and transfer switches from a PC

SPEC YOUR JOB AT KOHLERPOWER.COM
Bridging the gap between loss of utility and standby power is no small task. KOHLER® automatic transfer switches (ATS) are designed to meet that challenge, distributing power to feed the critical loads of your facility.

Every transfer switch needs a controller to ensure transfer of power from utility to generator and back again. KOHLER Decision-Maker® MPAC® controllers offer clear choices in matching function to application.

**STANDARD FEATURES**

**MULTIPLE APPLICATIONS**
Find the perfect option. KOHLER transfer switches are available in standard, bypass-isolation and service-entrance configurations with open, closed and programmed transition operating modes, from 30 to 4000 amps.

**SEAMLESS SYSTEM INTEGRATION**
Everything works together. KOHLER transfer switches are designed to interface perfectly with KOHLER generators and switchgear.

**ADVANCED COMMUNICATIONS**
Every transfer switch comes fully loaded with the technology to do the job. Ethernet and Modbus communications capabilities are available.

**CERTIFIED PACKAGES**
Transfer switches are UL listed and have CSA and IBC certifications available.

---

**ATS LINEUP**

**PEACE OF MIND STARTS HERE.**

STANDARD ATS  
SERVICE ENTRANCE ATS  
BYPASS-ISOLATION ATS
<table>
<thead>
<tr>
<th>KOHLER PRODUCT SERIES</th>
<th>DECISION-MAKER® MPAC® 750</th>
<th>DECISION-MAKER MPAC 1200</th>
<th>DECISION-MAKER MPAC 1500</th>
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<tbody>
<tr>
<td><strong>Comparison Features</strong></td>
<td><strong>Basic</strong></td>
<td><strong>Advanced</strong></td>
<td><strong>Mission-Critical</strong></td>
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<tr>
<td><strong>Amperage</strong></td>
<td>Up to 1000 A</td>
<td>Up to 4000 A</td>
<td>Up to 4000 A</td>
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<td>Single/Three</td>
<td>Single/Three</td>
<td>Single/Three</td>
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**Product Type**

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<tr>
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<td>Service Entrance</td>
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**Withstand and Close-On Ratings (WCR)**

<table>
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<tr>
<td>WCR – Specific Breaker</td>
<td>30-65 kA</td>
<td>30-65 kA</td>
<td>22-100 kA</td>
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<tr>
<td>WCR – Any Breaker</td>
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<td>10-100 kA</td>
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<tr>
<td>WCR – Current Limiting Fuses</td>
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<td>100-200 kA</td>
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<td>Short-Time Withstand Rating</td>
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</table>
Custom Configuration: The Chart Tells the Story.

You can custom configure switches by choosing the exact components needed. This standard process allows Kohler to provide the correct switch for your application with delivery in the shortest amount of time.

Each letter and numeral corresponds to a specific element of the ATS. Here’s an example.

KOHLER® Automatic Transfer Switch (K)

- Bypass-isolation mechanism (B)
- Programmed transition (P)
- Decision-Maker® MPAC® 1500 controller (D)
- 480 V, 60 Hz (M)

KBP-DMVA-0150S

MECHANISM | TRANSITION | CONTROLS | VOLTAGE | POLES/WIRES
--- | --- | --- | --- | ---
S – Standard (Specific Breaker) | S – Standard | J – MPAC 750 | C – 208 V / 60 Hz | T – 3-Pole / 4-Wire, Solid Neutral
B – Bypass-Isolation (Type B) | C – Closed | D – MPAC 1500 | F – 240 V / 60 Hz | V – 4-Pole / 4-Wire, Switched Neutral
G – Bypass-Isolation (Type G) | B – MPAC 1200 Non-Automatic | G – 380 V / 50 Hz | W – 4-Pole / 4-Wire, Overlapping Neutral
E – Service Entrance | F – MPAC 1500 Non-Automatic | H – 400 V / 50 Hz | J – 416 V / 50 Hz
| | | | K – 440 V / 60 Hz
| | | | M – 480 V / 60 Hz
| | | | N – 600 V / 60 Hz
| | | | P – 380 V / 60 Hz
| | | | R – 220 V / 60 Hz

ENCLOSURE | AMPS | CONNECTION | UTILITY (KEP) | GENERATOR (KEP)
--- | --- | --- | --- | ---
A – NEMA 1 | 30–4000 | S – Standard | M – MCCB TM 100-200 A | K – MCSW 100-1200 A
B – NEMA 12 | F – Front | N – MCCB ET 250-800 A | M – MCCB TM 100-200 A
C – NEMA 3R | P – MCCB ET GF 1000-1200 A | N – MCCB ET 250-1200 A
D – NEMA 4 | R – ICCB ET 800 A | Q – ICSW 800-4000 A
F – NEMA 4X | T – ICCB ET GF 1000-4000 A | R – ICCB ET 800-4000 A
G – OPEN

MCCB = Molded-Case Circuit Breaker
ICCB = Insulated-Case Circuit Breaker
MCSW = Molded-Case Switch
ICSW = Insulated-Case Switch
TM = Thermal-Magnetic Trip Unit
ET = Electronic Trip Unit
STANDARD TRANSFER SWITCH

A standard transfer switch has a single mechanism that transfers the load from one power source to another power source. It’s the most common type of application.

- Available in standard/open, delayed/programmed and closed transition

BYPASS-ISOLATION TRANSFER SWITCH

A bypass-isolation transfer switch bundles an automatic and a manual transfer switch into a single unit.

Bypass isolation is used to transfer power to the manual switch to allow servicing of the ATS while maintaining power to the facility. When the primary automatic transfer switch is in test or isolate position, the manual transfer switch is powering the loads.

Bypass isolation is commonly used in hospitals, data centers and other critical applications where interruption of power for service or maintenance can’t be tolerated.

- One contactor serves as the day-to-day automatic transfer switch
- One contactor serves as a manual transfer switch that bypasses and isolates the automatic switch
- Available in standard/open, delayed/programmed and closed transition

SERVICE ENTRANCE TRANSFER SWITCH

A service entrance transfer switch serves as both the automatic transfer switch and the utility disconnect, with circuit breakers and motor operators utilized as the transfer switch mechanisms.

- The breaker on the normal/utility source serves as the main entrance point for the utility
- The emergency/generator source disconnect can be configured as either a breaker or a switch
- Available in delayed/programmed transition
The transfer switch controller manages the power sensing, timing functions and fault monitoring needed for automatic operation. Depending on your application, the switch can be configured to operate in one of three modes: standard/open transition, delayed/programmed transition or closed transition.

**STANDARD/OPEN: BREAK BEFORE MAKE**
In open transition, the load is disconnected from one source before being connected to the alternate source. This is the most common type of application, used for loads that are not highly inductive or mission-critical.
- One set of contacts opens before the other set closes
- Load is disconnected from power during transfer

**DELAYED/PROGRAMMED: BREAK BOTH SIDES**
Delayed/programmed mode is used with highly inductive loads such as motor loads and transformers. The load disconnects from one source, then pauses in an “off” position before connecting to the alternate source to protect from power surges. The delay allows the magnetic field to decay to a safe level before transferring. Delayed transition can also be used with the load shed option for lower-priority loads.
- One set of contacts opens before the other set closes
- The other set of contacts delays in closing
- Load is disconnected from power during all transfers
- Delay time is user-programmable

**CLOSED TRANSITION: MAKE BEFORE BREAK**
Closed transition is used in mission-critical applications, such as data centers and hospitals, where the system can’t withstand a momentary load interruption. The source from which the load is being transferred remains closed until the source to which the load will be transferred is also closed. After both sources are closed, the source from which power is being transferred is opened.
- Contacts overlap, with both sources providing power
- Both sources synchronize before transfer occurs
- Load is never disconnected from power during transfers when both services are available
- Transfers via open transition if one source fails or fails to sync
- External fail-safe timer provided
NEMA ratings were developed by the National Electrical Manufacturers Association to rate enclosures for industrial environments. Also known as UL enclosure TYPE ratings, they specify standards of protecting equipment against weather, water, dust and light.

Choose a NEMA-rated enclosure based on where you’ll install the transfer switch.

**NEMA 1 – GENERAL PURPOSE**
- For indoor use under normal conditions
- Protects against dust, light and indirect splashing of water
- Prevents contact with live electrical parts

**NEMA 3R – WEATHER-RESISTANT**
- For indoor or outdoor use
- Provides protection against falling rain and ice formation
- Meets design tests for inadvertent access, external icing and rust resistance

**NEMA 4 AND 4X – WATERTIGHT AND WEATHERPROOF**
- For indoor or outdoor use
- Provides protection against splashing and hose-directed water
- Constructed of corrosion-resistant material
  - 4 = steel
  - 4X = stainless steel

**NEMA 12 – GENERAL PURPOSE**
- For indoor use
- Protects against circulating particles and dripping of non-corrosive liquids
- Meets drip-, dust- and rust-resistant tests
Withstand and close-on rating (WCR) is comprised of two measurements: the ability of the transfer switch to withstand fault (short circuit) current for a specific period of time while maintaining functionality; and the ability of the transfer switch to close into a fault and continue to operate. The time period is determined by the time it takes for an upstream protective device to interrupt the current.

The required WCR level for a given application is driven by the electrical system’s short circuit study. Based on calculated available fault current at the transfer switch installation point and selective breaker trip times required to isolate and clear a fault at the point closest to the fault event, a realistic understanding of the transfer switch’s withstand capability can be seen. Choosing the correct WCR is important for two reasons: Selecting a transfer switch with an unnecessarily high withstand rating results in overspecification and added expense. On the other hand, a transfer switch with an insufficient withstand rating can incur significant damage to itself or other installed electrical equipment.

**SPECIFIC BREAKER**
A specific-breaker-rated transfer switch (also referred to as series-rated) is tested in coordination with specific upstream circuit breakers. Based on actual fault-current test curves, breakers that trip within the time/current range of the tested breaker are identified. Only those breakers listed on the transfer switch rating decal may be used (refer to image, left). WCR ratings for specific-breaker-rated transfer switches are typically higher than “any breaker” ratings.

**ANY BREAKER (UMBRELLA RATING)**
An ATS that passes the “any breaker” test (in accordance with UL 1008) can withstand a fault of a given magnitude for 3 cycles (or 1.5 cycles for transfer switches with a rating smaller than 230 A). This allows an ATS to be used with any UL489 circuit breaker.

**CURRENT-LIMITING FUSE**
A current-limiting fuse limits the amount of current that passes through during a fault and protects downstream power system components from catastrophic failure.

The WCR required for a specific application may dictate the choice of breaker. Current-limiting fuses offer the highest rating, but fuses need to be replaced after a fault event. A “specific breaker” provides a higher rating but it limits your choice of circuit breaker. An “any breaker” provides a lower rating and offers the most flexibility when choosing a breaker or working with existing electrical equipment.
Sample breaker-rating label that appears inside every automatic transfer switch enclosure. The information will vary depending on rating.
A solid neutral or a switched neutral must be chosen when specifying an automatic transfer switch. A 2-pole/3-pole ATS has a solid, unswitched neutral; a 4-pole ATS has a fully rated switched neutral that follows the contactor position. The neutral switching can be open or overlapping (closed).

The emergency system grounding and ground-fault protection method determines the use of a 2-pole/3-pole or 4-pole transfer switch.

**SOLID**
- 2-pole or 3-pole
- Constant contact
- Generator is not a separately derived source

**SWITCHED**
- 4-pole
- Break-before-make on neutral
- Switching neutral with phase contacts
- Generator is a separately derived source

**OVERLAPPING**
- 4-pole
- Make-before-break on neutral
- Neutral contact momentarily tied between two sources while switching sources
- Generator is a separately derived source
National Electrical Code (NEC) and National Fire Protection Association (NFPA) regulations specify how ground-fault protection (GFP) must be handled for a generator system, which in turn determines the number of poles and neutral switching type required of the transfer switch. These regulations also determine whether or not a system needs the generator as a separately derived source.

**TWO-POLE/THREE-POLE TRANSFER SWITCHES**

A 2-pole/3-pole transfer switch has a solid neutral; the neutral connection is not dependent upon the position of the switch. In this system, the generator is not a separately derived source, and there is no neutral-to-ground link at the generator. Should a ground fault occur, it cannot be sensed by the generator breaker. In this example, it is sensed at the switchgear. If there is a ground fault at point A, the current will leave at point A and must find a way back to the generator (along the neutral). Its only option is to flow along the ground and return into the system at the neutral-to-ground bond at the switchgear (shown at point B).

**FOUR-POLE TRANSFER SWITCHES**

In order for the generator’s current-based ground fault sensor to detect the ground fault and trip the generator unit-mounted circuit breaker, a 4-pole transfer switch is needed. Because the neutral is switched and not continuous, the generator is a separately derived source that needs a neutral-to-ground link at the generator. In this example, if there is a ground fault at point B, the current will leave at point B, and it needs to find a way back to the generator (along the neutral). Its only option is to flow along the ground and return into the system at the neutral-to-ground bond at the generator (shown at point A). Because the sum of the current flow through the GF sensor is above its trip point, the breaker will trip.
DECISION-MAKER® MPAC AUTOMATIC TRANSFER SWITCH CONTROLLERS

The controller is the brain behind your automatic transfer switch. It tells the switch what to do and when, dictating the logic that determines the reaction.

DECISION-MAKER MPAC 750

Control critical system settings with a no-frills controller that gets the job done. Set time delays, create a system exercise and transfer loads as required.
- LED-indicated source status and switch position
- Programmable pickup and dropout voltage settings
- Fundamental programmable time delays
- Seven-day generator exercise schedule
- Two programmable inputs, two programmable outputs
- RS-485 standard and Ethernet optional communication

DECISION-MAKER MPAC 1200

A customizable solution for your specific application. The MPAC 1200 gives you full control of system behavior including extended I/O to customize to your needs.
- LCD display
- LED-indicated source status and switch position
- Programmable pickup and dropout voltage and frequency settings
- Comprehensive programmable time delays
- Programmable generator exerciser
- Two programmable inputs, two programmable outputs
- Up to four I/O extension modules
- RS-485 standard and Ethernet optional communication
- Time-based load control

DECISION-MAKER MPAC 1500

When you need to manage your loads, use your system as a prime power application or have a backup for your backup (i.e., a three-source system); this controller gets the job done.
- LCD display
- LED-indicated source status and switch position
- Programmable pickup and dropout voltage and frequency settings
- Comprehensive programmable time delays
- Programmable generator exerciser
- Two programmable inputs, two programmable outputs
- Up to four I/O extension modules
- RS-485 and Ethernet standard communication
- Current- or time-based load control
- Three-source system
- Prime power
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<tr>
<th>ATS Configuration</th>
<th>MPAC 750</th>
<th>MPAC 1200</th>
<th>MPAC 1500</th>
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<td>Delay/Programmed Transition</td>
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<td>Optional (Up to 4 Modules)</td>
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<tr>
<td>Prime Power</td>
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THREE-SOURCE SYSTEM: BACKUP TO YOUR BACKUP
A three-source system offers redundancy without the complexity or cost of a paralleling system. Available with the MPAC® 1500 controller, the system is based on two generators and two automatic transfer switches.

- The first ATS determines if the load is powered by utility or generator
- The second ATS determines which generator is powering the load

THE BENEFITS ARE MANY
- One generator is available when the other is being serviced
- You have automatic backup power from the second generator; many critical power applications require this
- By alternating generator runtime and extending the time it takes to accumulate engine hours, you extend time between maintenance and overhauls
- You lengthen the time between refueling, because you have two fuel sources – one for each generator
- You have peace of mind knowing that if one generator fails, the other is automatic – it’s backup to your backup
A generator is only as good as its power output. If the loads exceed the output capacity, the system’s voltage and frequency can destabilize and stress the generator. To prevent damage to the system, the generator will shut down.

One way to maintain a stable system is to remove or add certain loads as needed. This keeps the generator powering the more critical loads at all times. Kohler offers several ways to accomplish this.

**LOAD SHED**
Load shed allows a programmed transition switch to transfer to the off position, removing all loads of the ATS from the generator. This should only be used for an ATS that powers lower-priority loads. Once shed, the switch remains in the off position until power is returned to the utility; the switch then transfers to utility. To use this feature, a load-shed module must be installed.

**LOAD CONTROL**
Load control allows up to nine individual loads to be added or removed.

**CURRENT-BASED LOAD CONTROL**
Current-based load control adds and removes load based on the current measurement of the system. To utilize this feature, a current-sensing kit and I/O modules must be installed. Removing or adding loads based on current can be done at any time during the operation of the ATS.

For example, when output capacity cannot meet the load demands, the system removes low-priority loads when the current is not within a tolerable limit. By removing the low-priority loads, the output of the generator can meet the demand and allow for a stable system. As the system remains stable, the load control determines if and when additional loads can be added back to the system.

**TIME-BASED LOAD CONTROL**
Time-based load control adds and removes loads based on pre-transfer and post-transfer of the switch. To use this feature, I/O modules must be installed. The removal and addition of the loads is done only at the time of transfer.

For example, in some applications, several motors might be powered by one generator. Due to the motors’ current draw at initial start, the generator can’t start all of them at once. Time-based load control allows one or several motors to be placed on a time delay at start-up, allowing the generator set to start some motors at initial start-up and then add other motors when the time delay expires. Without the time delay, a larger generator or multiple generators may be required.
While every ATS comes to you fully featured, KOHLER® transfer switch accessories allow further customization to suit your facility’s unique needs.

**INPUT-OUTPUT (I/O) MODULES**

**Programmable Standard I/O Module**
This is a separate I/O module with two programmable inputs and six programmable outputs (0.5 A @ 30 VDC/120 VAC).

**Programmable High-Voltage/Current I/O Module**
This is a separate I/O module with two programmable inputs and three programmable outputs (2 A @ 480 VAC or 10 A @ 240 VAC).

**Programmable Alarm Module**
This module offers a 90 dB alarm horn and programmable values for alarm annunciation. The module allows preferred source, supervised transfer control switch and Chicago alarm functions. Preferred-source selection lets the operator designate “normal” or “emergency” source. User interface with system-alert LED indicator shows when the alarm is silenced.

**External Battery Supply Module**
The external battery supply module (EBSM) provides power to the controller while waiting for the generator to start. It allows for an extended generator start-time delay and is required to power the controller on the second ATS in a three-source system. It produces 12 VDC output with 9-36 VDC input and is reverse-polarity protected.

**ANTI-CONDENSATION HEATER**
The strip heater is provided in 125 or 250 W models. A hygrostat, which is user-selectable for proper humidity, is also included.

**CONTROLLER DISCONNECT SWITCH**
This switch removes power from the controller to allow servicing or maintenance.

**CURRENT-SENSING KIT**
The current-sensing kit is sized when the transfer switch is configured. It’s installed on the load side of the contactor. A shorting-type terminal block is used to allow safe disconnection to the controller. The current in each line is displayed on the LCD user interface screen, within 2% accuracy.

**DIGITAL METER KIT**
The digital meter kit provides an LED display for voltage (phase to phase), amperage (each phase), frequency, power (kilowatts), volt-amperes (VA), reactive volt-amperes (VAR), power factor and watt demand.
TRANSFER SWITCH ACCESSORIES
ADD FUNCTION AND FLEXIBILITY.

GENERATOR CONNECTION BOX
The generator connection box enables a quick, safe connection of a generator set to the source terminals of a transfer switch. It’s designed to function as a permanently installed, inlet-style assembly rated at 600 VAC or less. It has a NEMA 3R enclosure for outdoor or indoor installation with a hinged, lockable door for controlled access.

LINE-TO-NEUTRAL VOLTAGE MONITOR
This module enables the user to view line-to-neutral voltage on 2- and 3-pole transfer switches. Four-pole switches and 30-230 A KCS switches include line-to-neutral voltage monitoring capability as standard.

LOAD-SHED MODULE
The load-shed module allows the programmed transition transfer switch to transfer the load from the emergency position to the off position using an external contact closure input.

MONITOR III COMMUNICATIONS PROGRAM
The program allows the status and control of transfer switches in local and remote-area networks to be displayed on a PC.

REMOTE ANNUNCIATOR
The remote annunciator allows remote monitoring and testing of up to four transfer switches connected in an RS-485 or Ethernet network.

SUPERVISED TRANSFER SWITCH
The three-position selector switch (auto-manual-transfer) is key-operated to place the ATS in one of three modes:

- Automatic position allows complete automatic function of the controller
- Manual position requires supervised control of the transfer when two sources are available
- Transfer position enables the controller to perform a transfer function

The supervised transfer switch has fail-safe operation; the transfer occurs automatically if the source to which that transfer switch is positioned fails and the alternate source is available.

SURGE PROTECTIVE DEVICES (SPD)
The surge suppressor is a 10-mode, 100 kA device with LED indication of condition, an auxiliary contact with terminal block and a 30 A circuit breaker disconnect.

USER INTERFACE COVER
The cover is hinged and lockable with a padlock and protects the door-mounted user interface.
You’re never too far from Kohler. Across the world, more than 800 locations are ready to provide sales, installation and aftermarket support services. And each one offers expertise in power specifications, equipment and integration. There’s no question they can’t answer. We should know, we trained them ourselves.

Plus, if you ever need assistance in the middle of the night, we’ll take care of you. KOHLER Power professionals are available to offer troubleshooting, advice, service and support.

SERVICE AND SUPPORT
THE HELP YOU NEED. ANY TIME, ANYWHERE.
Our reputation was born 90 years ago at the South Pole. There in the world’s most brutal climate, Admiral Richard Byrd and his band of explorers plunged headlong into Arctic temperatures with nothing but KOHLER® generators to power their conquest. Since then, our generators have made their presence known worldwide, powering every application including education and healthcare to data centers and wastewater treatment.

Bottom line, KOHLER industrial power systems are built to work. Before our systems see the light of day, they endure the industry’s tough testing standards – including power, transient, sound, cooling and complete system performance.

When the world goes haywire, you’ll be ready.