

Standing watch, 24/7

Kato Defense Products

Generators • Motor-Generator Sets • Controls



KATO
Engineering Inc.

On duty for over 65 years

Serving the U.S. Military

Today's world can be a dangerous place. That is why defense forces around the globe must always be ready. They must be prepared to spring into action at a moment's notice. And from Navy ships to Air Force bases, from Coast Guard cutters to Army defense systems, Kato generators are standing by also, waiting to perform on demand.

At Kato Engineering, we've been working with the U.S. and other military forces for over 65 years to provide reliable, efficient and economical generators, motor-generator sets and controls.

Deep inside dozens of ship's hulls, Kato equipment is at work, supplying reliable prime or standby hotel power and power regulation. Kato motor-generator sets and high-frequency generators provide line conditioning and frequency conversion for sensitive applications, such as aircraft ground power, radar stations and computer centers. In government and defense buildings worldwide, Kato generators are a trusted source of emergency power.

No matter what the job and where the location, Kato Engineering generators are ready to spring into action on demand, 24/7.

Kato Engineering received its first government contract in 1938: to furnish the original 31 U.S. Army flying fields with AC generators for ground instrumentation. When WW II began, Kato was swamped with orders for field hospitals, ships, army camps and other military operations.



Standards:

ISO 9001
Mil-G-3124
Mil-R-2729
Mil-S-901

Superior design and manufacturing capability

Kato Engineering has a superior staff of professionals to support research & development, design, manufacturing and service activities. And, as a subsidiary of Emerson, Kato has a network of human resources, technical knowledge and manufacturing capability available to augment our North Mankato, MN manufacturing facility. All of these assets allow us to use the latest technology to provide a reliable product with an economical price.

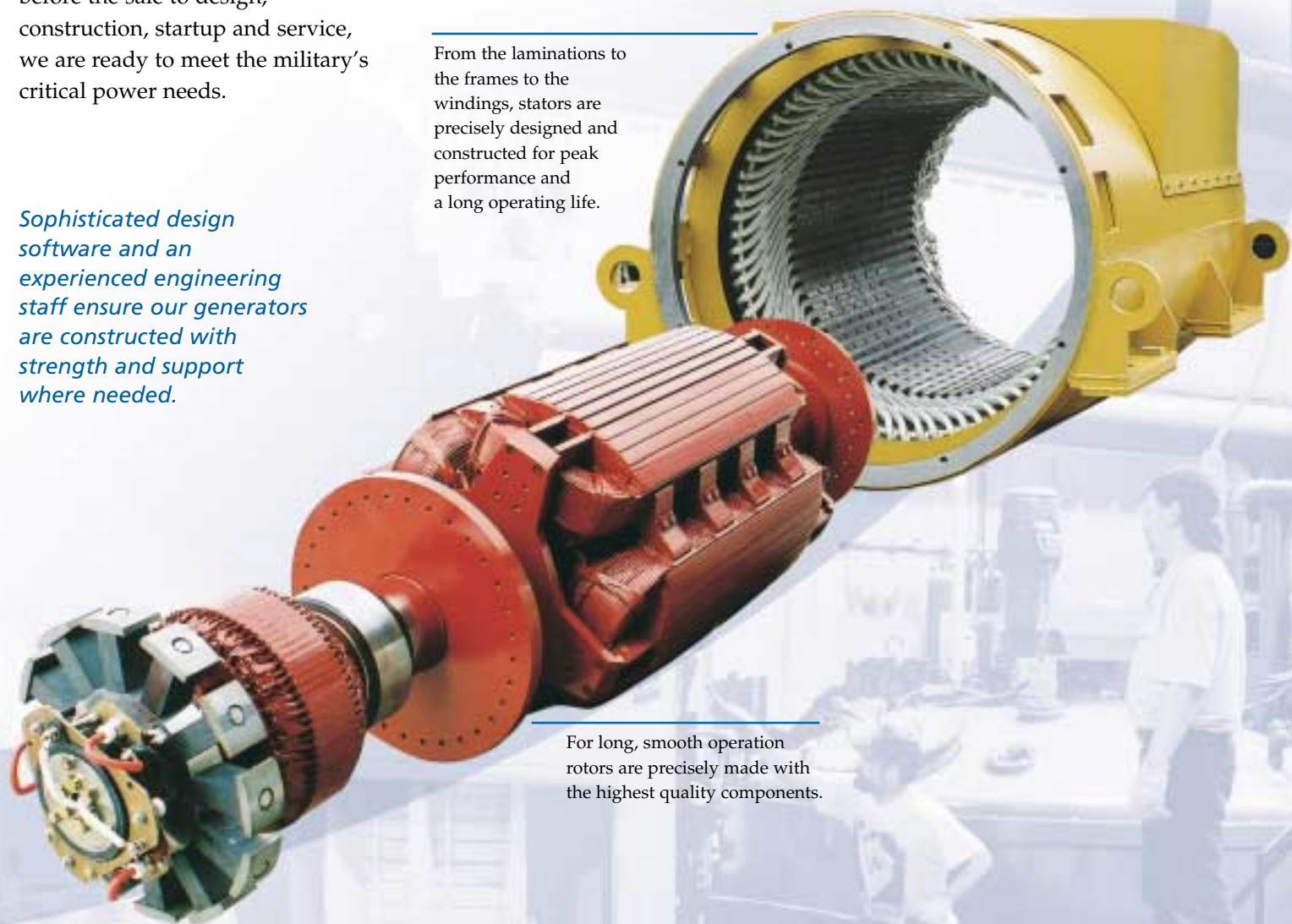
From manufacturing existing designs to developing new, cutting-edge technology, from providing technical information before the sale to design, construction, startup and service, we are ready to meet the military's critical power needs.

Sophisticated design software and an experienced engineering staff ensure our generators are constructed with strength and support where needed.



Finite element analysis is an integral part of Kato Engineering's development and design programs.

From the laminations to the frames to the windings, stators are precisely designed and constructed for peak performance and a long operating life.



For long, smooth operation rotors are precisely made with the highest quality components.

AC Generators for Ship Hotel Power

Kato's navy ship applications run the gamut from launching platforms to fighting ships, from support crafts to research & survey vessels. And the Kato generators on board provide reliable emergency or complete vessel power.

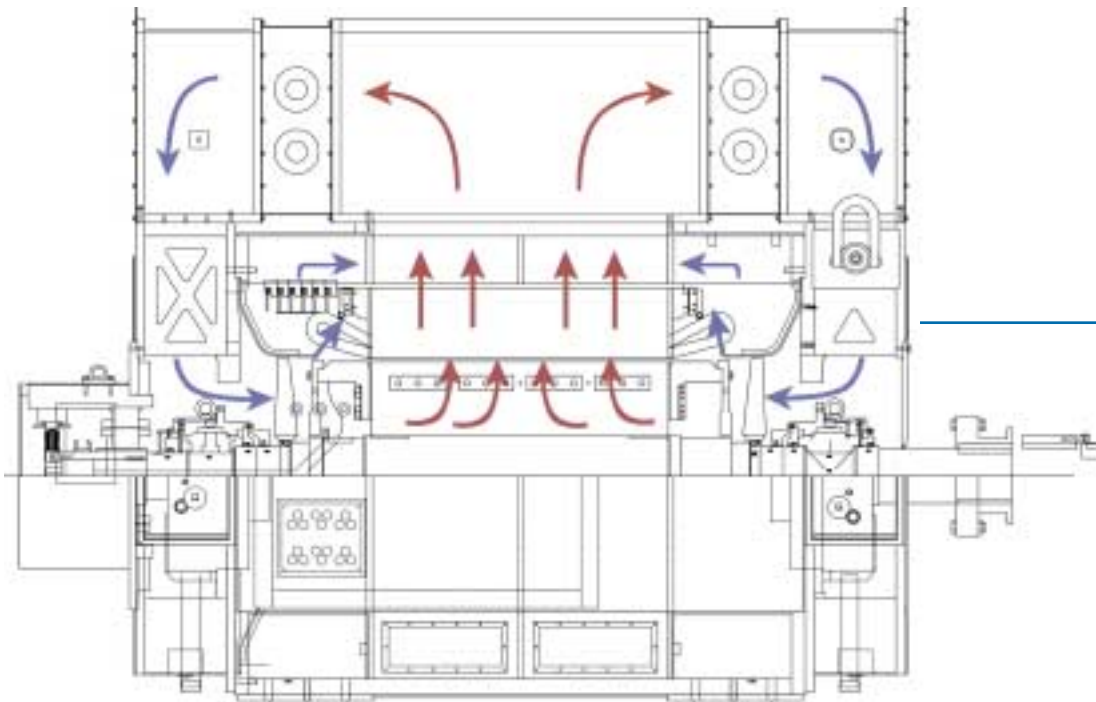
High-shock bearings and a rugged frame on Kato ship generators absorb and dissipate constant pounding dished out by turbulent seas.

Totally enclosed units are equipped with one or two internal fans. Air is forced up and through a large air-to-water radiator, which is within the generator enclosure. Air is continually re-circulated with the heat created from the generator being displaced by cool water from the radiator coils. The radiator consists of an inner tube of 90-10 copper-nickel for corrosion resistance and an outer tube to prevent water leakage.

The U.S. Navy proved Kato Engineering generator's durability in rugged shock tests prior to accepting Kato as a standard for its FFG frigates.



High-shock tests ensure the generator can withstand the force of an enemy attack.



Airflow through an air-to-water exchanger cooled (TEWAC) unit

High-voltage insulation

The Navy's demand for greater power density has increased the need for generators with high voltage output. While 480 V was the standard for ship applications, 13.8 kV requirements are now common. In order to meet these demands, Kato Engineering has developed a new, high-voltage stator coil.

The coils are insulated in epoxy-bound mica/glass tape. A black carbon semi-conductive tape is applied on the straight section of the coil, located in the stator slot. This provides a void-free electrical connection between the groundwall insulation in the stator core to prevent partial discharges in the slot. Corona stress grading tape is applied on the end windings to provide electrical stress relief at the junction where the coil exits the slot.

Entire stator assemblies are immersed into liquid thermosetting epoxy resin insulation and vacuum-pressure impregnated. The vacuum exhausts air and moisture and other vapors from the windings and permits complete penetration of the epoxy resins, filling voids and creating a rigid mass with optimum dielectric strength. The equipment Kato Engineering uses to make these coils is, indisputably, the most modern, most precise and best in the world.



High-voltage coil

In addition to dozens of command, transport, intelligence and other auxiliary vessels, Kato Engineering currently has generators on the following U.S. Navy ships:

DDG 51 (Arleigh Burke) Class

FFG 7 (Oliver Hazard Perry) Class

AOE 6 (Supply) Class

LHD 8 (Wasp) Class

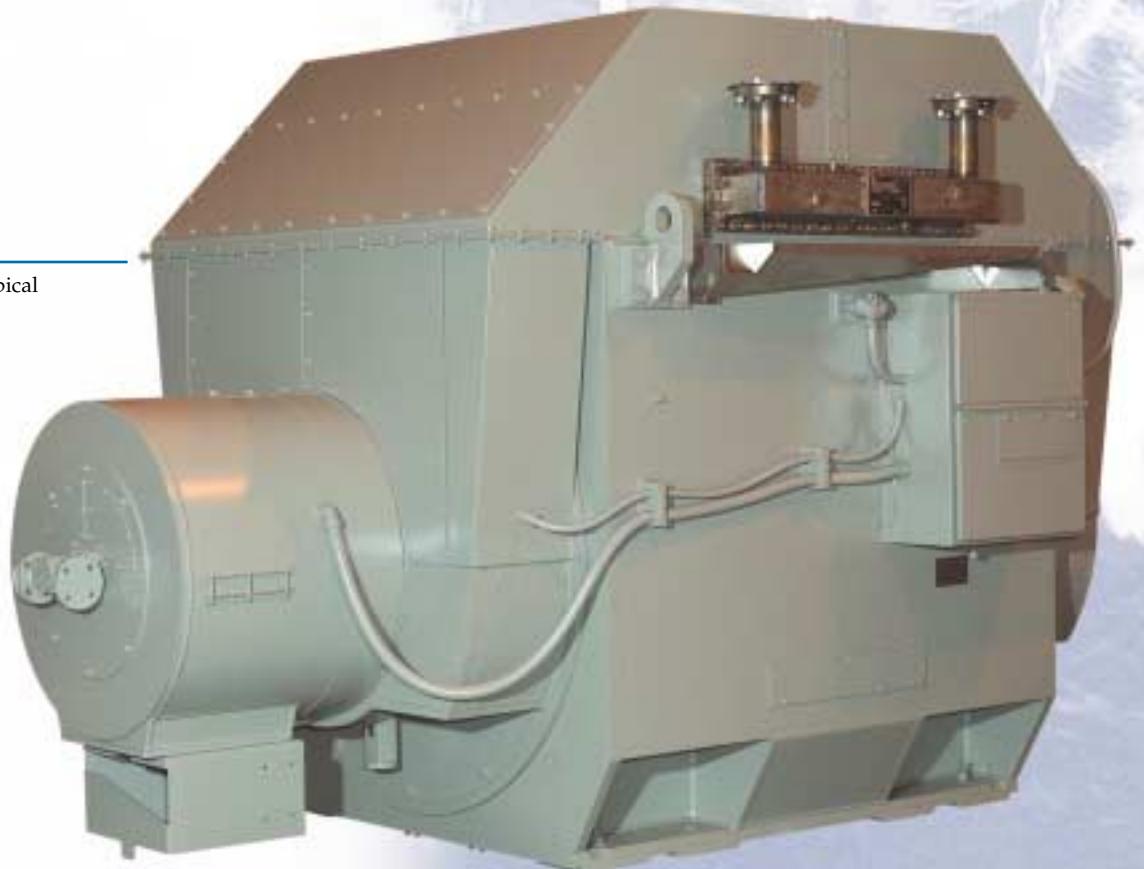
LPD 17 (San Antonio) Class

LPD 4 (Austin) Class

CVN 68 (Nimitz) Class

CV 67 (John F. Kennedy) Class

Water-cooled generator for a typical Navy ship's prime power



Motor-Generator Sets and 400 Hz Generators

Military forces around the world find Kato Engineering motor-generator (MG) sets and high-frequency generators a reliable source of power for line conditioning, load isolation and frequency conversion.

Sophisticated electronic systems, such as computer centers, missile guidance systems and radar equipment use Kato motor-generator sets to block harmonics, line transients, phase unbalance and frequency fluctuations. On Navy and Coast Guard vessels, Kato MGs provide a power link between the ship's main generators and sensitive navigational equipment. In exotic seaports all over the globe, Kato motor-generator sets deliver economical power, converting shore frequency to shipboard frequency.

Military air forces worldwide use Kato motor-generator sets and high-frequency generators as a dependable source of power for aircraft ground support services that ensure plane readiness for scrambling pilots.

Ruggedly built to exact specifications, all of these Kato units perform equally well in the deserts of the Middle East as they do in the icy Arctic Sea or the jungles of Southern Asia.



The US Coast Guard icebreaker "Cutter Healy" uses a Kato 60-60 Hz motor-generator set to provide clean power for sensitive equipment.



Tracking stations use Kato motor-generator sets as a source of clean, high-frequency power.



Motor-generator sets

Long life, minimum maintenance costs, low harmonics, high overload capacities and many other features make motor-generator sets a clear choice over solid-state systems.

With input of 50 or 60 Hz, output frequencies of 50, 60, or 400 Hz are available as standard with other frequencies available up to 1200 Hz. Power capacities range from 10 kVA to 20,000 kVA and up, depending upon system requirements.

Controls for motor-generator sets can be unit mounted, wall mounted or free standing. Kato Engineering also offers a variety of lifting provisions, framing and enclosures. Weather-proof enclosures provide for complete isolation from the environment and can be used for sound attenuation. For portability, we can provide motor-generators with a trailer mount.

400 Hz generators

Kato Engineering Inc. offers a complete line of high frequency (400 Hz) generators. These units provide economical power for grounded aircraft's navigational equipment, ground power and military support products.



Engine-driven Kato 400 Hz generators supply reliable aircraft ground support in auxiliary power units.



Totally-enclosed motor-generator for missile application



Motor-generator set with unit-mounted panel

400 Hz generator

Regulators

Kato Engineering also supplies voltage regulator systems for navy vessels. Designed for specific applications and prime movers, these regulator systems meet the military high-shock, temperature and vibration requirements while maintaining precise control of the generator voltage at varying loads. Built with redundant circuitry, they can be designed for parallel operation with load-sharing capability, frequency-dependent voltage control, and performance in response to prime mover loading, as well as other features needed for specific applications.

Parts and Service

We at Kato Engineering know how important our military customers' power needs are. That is why we have experienced factory field service personnel on call 24 hours a day, every day of the year.

As well as repair and on site rebuilding, we can assist you with installation and startup and perform scheduled maintenance or training. We stock a variety of parts for quick delivery.

We provide technical manuals in a variety of formats. These manuals include operation, maintenance and illustrated parts breakdown.

Our knowledgeable and friendly staff is always ready to answer your questions, send a needed component or arrange a site visit anywhere in the world.

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Kato regulator for Navy submarine applications

Ship photos pages 1, 5 and 8, radar photo page 6 courtesy of the U.S. Navy. Cutter Healy page 6 courtesy of the U.S. Coast Guard. Tracking station page 6 courtesy of NASA/JPL/Caltech.

