KOHLER POWER SYSTEMS

Kohler Co. has long been recognized as a forerunner in the electrical engineering industry, from the first generator set that delivered power directly to small motors and lights, to the sophisticated systems produced today.

Kohler manufactures a full line of engine-driven generator sets from 5 kW to 2.0 megawatts, transfer switches from 30-4000 amperes, and switchgear to control the complete electrical power system.

Kohler power systems are designed for three basic applications, energy management, emergency/standby and prime power. As a manufacturer of all components – engine generator sets, transfer switches and switchgear – Kohler ensures proper interfacing of all components, complete factory testing of the entire power system, and the capacity for future expansion.

Your authorized Kohler distributor will recommend equipment options, service the complete power system under one warranty, furnish information on system capabilities, and deliver the reassurance that only Kohler Power Systems provide.

Kohler TR-SERIES Generators

The largest in Kohler's generator set lineup is the TR-SERIES, offered with a variety of cooling and exhaust system options and a complete line of accessories.

TR-SERIES generator sets, 350 kW - 2.0 megawatts, can be equipped to meet the requirements of prime power applications at heavy construction sites, mining and timbering operations, and industrial plants. And with the ability to be connected in parallel, these generators will meet any output requirements. The TR-SERIES is also ideal for interruptible rate applications at factories and other facilities that wish to curtail electrical energy costs, while enhancing operating security.

When outfitted with the full complement of accessories and the sophisticated Decision Maker solid state controller, TR-SERIES gensets surpass the strict conditions of the National Fire Protection Association for hospitals (NFPA 99) and emergency and standby power systems (NFPA-110).

The brushless design ensures less frequent maintenance intervals. Standard components include a pre-lubricated ball bearing and a flexible disc coupling between the engine and generator. All Kohler TR-SERIES generator sets utilize NEMA class H insulation materials, five varnish dips and a fungus resistant epoxy coating for moisture and abrasion protection.

To eliminate third harmonic neutral currents during parallel operation, these four-pole rotating field generators utilize two-thirds pitch windings.

Heavy duty diesel engines supply the power for this generator set series, with self protection features for overcranking as well as cutouts for high water temperature, engine overspeed and low oil pressure.

Kohler FAST RESPONSE Series Generators

Kohler's FAST RESPONSE series, 20 to 300 kW, is well known for its exceptional motor starting ability and voltage recovery – ten times faster than many competitive generators of an equivalent

rating. With FAST RESPONSE generators, even 50% load changes are virtually imperceptible. The ability of FAST RESPONSE generators to recover within 0.05 seconds actually takes place before such a voltage dip caused by generator impedance reaches full value. It's the reason FAST RESPONSE gensets have better motor starting ability than competitive models.

When supplying power to electronic equipment that's sensitive to voltage transients, FAST RESPONSE gensets are the obvious choice. Though all generators lag between the time excitation is applied and the generator responds with greater output, the problem in conventional generator sets is two-fold. First, the exciter response lag when the exciter field is energized, and second, the typical generator response time. The design of FAST RESPONSE completely eliminates exciter lag with "on-shaft" control and a full powered exciter.

FAST RESPONSE generator sets will also coordinate branch circuit protection without additional current boosting equipment. When a short occurs on a system connected to a FAST RESPONSE genset, power is returned rapidly to unaffected circuits.

Just as in a conventional generator set, the instantaneous high current draw resulting from a short causes the FR generator output level to fall. However, since the FAST RESPONSE exciter is not dependent on AC output, the Kohler voltage regulator quickly restores full exciter current to the generator field. Almost instantly, generator output reaches at least 600% of rated current and sustains approximately 250%.

Such high current selectively trips the branch circuit breaker connected to the short circuit. The short circuit is removed, voltage rises and generator power is restored. A similar situation with a conventional generator set would result in a total loss of power on all circuits – in effect, a blackout of the standby/emergency power source.

Kohler R-SERIES Generators

Emergency power is equally important to small facilities. Although output requirements may not be the same, Kohler believes that full monitoring information, uncompromised performance levels and a broad range of optional equipment should be available for power systems under 20 kW as well.

The R-SERIES has been designed for applications at single family homes, smaller clinics and nursing homes, stores and schools, theaters and switching stations, police and fire departments, agricultural confinement operations, radio stations and small professional buildings.

Models are available from 5 to 18 kW, gas, gasoline or diesel fueled. Most units feature rotating field design, as well as three-phase reconnectable voltages up to 480 volts. And all R-SERIES gensets are equipped with Kohler's solid state regulator for voltage regulation within +/-2%.

Our relay controller is standard on all R-SERIES gensets and frequently specified for prime power and basic standby duties. An optional solid state controller is designed to meet the NFPA-99 code for health care facilities. All Kohler controllers may be mounted to the generator itself, or isolated from the generator at a nearby monitoring station.

Self protection features for the R-SERIES include overcranking control, automatic cutout for engine overspeed, low oil pressure and high engine temperature. Full amortisseur windings are standard, and smooth wave forms are achieved with skewed rotors.

Kohler Controllers

Greater reliability, accuracy and efficiency distinguish our advanced generator set controller – the Kohler Decision Maker. Built around a single-chip digital microcomputer, the Decision Maker has a memory, logic, data bus, control bus and I/O ports in one 40-pin integrated circuit.

Kohler has simplified the control mechanism through large scale integration – solid state technology has reduced the number of components more than 600% while performance and function continually improve.

Hardware and software filters protect the Kohler microcomputer Decision Maker from radiated electrical "noise." Because of momentary voltage dips which occur during engine start-up, the design scheme provides low voltage operation of logic functions during cranking, using a single five-volt power supply. These features make Decision Maker controllers virtually immune to false input signals.

The problems caused by vibration, inherent to all generator sets, has been solved by isolating the controller from the generator's prime mover. And to avert potential problems of extreme climatic conditions, Kohler designs system components that function in temperatures from -40°F to 185°F (-40°C to 85°C).

Decision Maker controllers are available for all Kohler generator sets from 6.5 kW to 2.0 megawatts.

Manual start controls for prime power applications and engine gauge panels designed to interface with paralleling switchgear are also available from Kohler. To accommodate more options such as watt meters, tachometers or other specified monitoring gauge controls, controllers are also available with an oversize meter box.

Kohler Automatic Transfer Switches

Kohler single coil solenoid automatic transfer switches are available in four configurations based on the intelligence circuitry. Kohler R340 models feature relay controls and range from 30 to 4000 amperes. All Kohler S340 models feature solid state controls. Kohler 340 models feature microprocessor based controls.

Solid state circuitry features dependable modular construction, ribbon connectors and flexible circuitry that provides almost unlimited accessory capability. Relay logic circuitry is an alternative construction method. Both relay and solid state controls for single coil automatic transfer switches meet the highest reliability standards.

All components – intelligence circuits, transformer assemblies, etc. – are accessible from the front of the switch, and printed circuit boards on solid state controls are keyed to ensure correct installation.

The complete line of Kohler transfer switches is available in both single phase and three phase models from 30 to 4000 amperes in two, three and three-pole with overlapping neutral (for 4-pole applications) configurations.

Voltage is always monitored phase to phase, not phase to ground (neutral), on both the normal and emergency sources. R340, S340 and M340 transformer assemblies are easily removed from

voltage conversion. The transformer assembly is available as a kit for solid state, relay and microprocessor control intelligence. Control relays feature gold-flashed contacts.

The series M340 (microprocessor) offers more accurate, user friendly control and diagnostic capabilities for remote communication with a host computer.

With the M340 models, microprocessor intelligence provides greater reliability, accuracy and flexibility than other types of circuitry. Reliability through fewer parts, accuracy through the use of digital techniques, and flexibility through the use of software programming to provide a very highly featured (accessorized) switch.

A keyboard provides input to the microprocessor and the LCD alpha numeric display provides information from the microprocessor.

With optional communications accessory, four methods of interconnection are possible with the host computer: Single Switch (hard wired), Local Area Network (LAN), Remote Single Switch (via telephone lines), and Remote LAN (via telephone lines).