

# Micro-Cogen Systems From Marathon Engine

It's fair to say that most generator set manufacturers don't make their own engines. The ones that do tend to be among the global giants.

And then there's Marathon Engine Systems.

Marathon, based in East Troy, Wis., produces a line of application dedicated combined heat and power (CHP) gen-sets. The units range from 1 to 5 kW in natural gas or propane powered configurations with specific models tailored to cathodic protection, luxury homes, net metering, telecommunications, remote locations and true uninterruptible power.

At the heart of each system is Marathon's 272 cc, single-cylinder, four-cycle, liquid-cooled 5K engine rated 7.5 hp at 1200 to 3600 rpm. The engine features a 4000-hour service interval and a 40,000-hour life which Gary Papas, vice president of engineering for Marathon, said equates into 1.6 million miles on an automobile engine. "This engine was designed to be durable so it can be placed in remote locations, running constantly," Papas noted. "In one remote prime power application it's connected to a gas well so it also has an unlimited fuel supply."

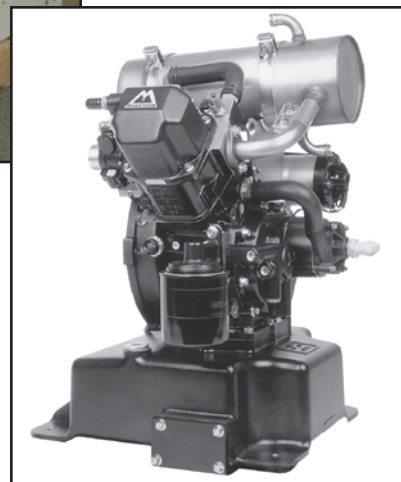
The cast iron engine was originally designed by the Gas Research Institute as a means to generate income during low usage months by powering residential heat pumps. Marathon purchased the rights to the engine in 1998. Today, it uses a top-mounted



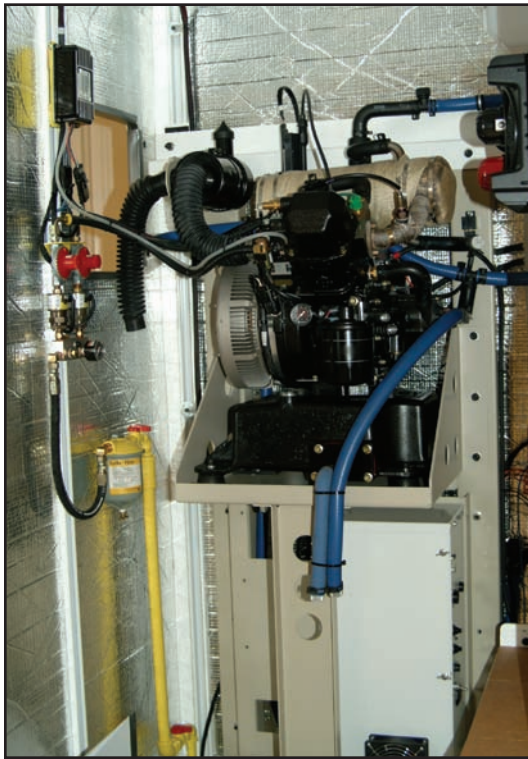
Micro-cogen manufacturer Marathon Engine features a line of application-dedicated gen-sets, including the Minotaur 2.5 kW unit used for cathodic protection in pipelines. Marathon's products are based on the Marathon 5K engine, rated 7.5 hp at 1200 to 3600 rpm. The engine uses a top-mounted exhaust gas heat recuperator with three-way custom catalyst to recover heat from the engine, generator and exhaust.

exhaust gas heat recuperator with three-way custom catalyst design to recover heat from the engine, generator and exhaust which Marathon said provides cogeneration with more than 90% efficiency. The 5K engine drives a high-efficiency, all-copper alternator with outside fitted coils designed by Marathon. The stator housing is coupled to the crankcase with the rotor mounted to the engine flywheel.

The CARB 97 and EU Stage 3 certified 5K engine is used in all five gen-set models produced by Marathon and its European partner, Power Plus Technologies, Gera, Germany. Power Plus supplies the European market



with the Ecopower gen-set, a 2 to 4.7 kW system designed for net metering. "Homeowners in Europe see a very fast return," said Papas. "It comes back to them in under three years." The Ecopower unit also has application in car washes, laundromats, homes,



**Powering 1 to 2.5 kW, Marathon's standup Power Rack CHP unit is targeted toward the telecommunication sector. The non-enclosed Power Rack is typically used in areas where an existing structure is already available to house the system.**

schools, lodges, hotels, small industry, agricultural, sport centers and swimming pools.

Marathon offers a modernized CHP version with its stainless steel enclosed PowerLast XLC package, as a prime power system for luxury homes. The PowerLast XLC produces 5 kW of grid independent power and 27,000 to 40,000 btu of heat for swimming pools, water heaters or hydronic heating in new homes. "It takes away the functions of the furnace, water heater and standby generator," said Papas. "It will be common in the future to have this offered as an option by every new home builder."

While the majority of Marathon's lineup is used in some form of heating, its Minotaur 2500 gen-set is a 2.5 kW single-phase system designed for cathodic protection of pipelines. The units are typically placed at 40-mile intervals, sending electrical current in both directions to inhibit the corrosion process or power railway switching and communications. The unit has a bullet-proof enclosure and in most instances processes the recovered heat through a radiator.

Also featured in the company's line-

up is the non-enclosed standup Power Rack, a 1 to 2.5 kW unit targeted toward the telecommunication sector and for prime uninterruptible power, a UPS unit. The UPS system provides 1 to 5 kW of pure sine-wave power at

120 Vac or 240 Vac. Marathon said the gen-set is designed with more than 400 amps of battery assistance, which can supply two days of power if the engine is shut down. The UPS system targets internet hosts, banking, medical companies or other industries where unexpected outages cause costly or catastrophic interruptions, explained Papas.

The four enclosed units feature a sound-attenuating enclosure with sound levels rated 56 to 64 dB(A), depending on model. The units are thermostat operated or remote accessed via phone or computer interface. Engine temperature, engine speed and power output are monitored on the unit's control panel in digital or gauge formats.

Marathon assembles the systems at its 67,000 sq.ft. facility in East Troy. Recent installations for the company include Ecopower units installed at a luxury home in northern Wisconsin and a Canadian canoe outfitter, along with a new contract with an Irish telephone service organization to supply units for prime power in cell towers. The company has over 500 units placed throughout Europe and expects to triple this number in the next two years. ★



**Marathon assembles the 5K engine and the CHP sets at its 67,000 sq.ft. facility in East Troy, Wis.**