



**THERMO KING**

# SGCM-3000e™

Center Mount Two Speed Fuel Saving  
Generator Set

With SG+ Controller

**TRANE**  
TECHNOLOGIES

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# Product specifications

## GENERAL DESCRIPTION

MANUFACTURER	THERMO KING CORPORATION
Construction	<ol style="list-style-type: none"> <li>1. The generator set is designed for mounting to the container chassis between the two main I-beams (centermount).</li> <li>2. It is a completely welded steel structural assembly</li> <li>3. Genset components (filters, hoses, wire harness, etc.) are installed and securely fastened to ensure dependable, long-term operation and ease of serviceability.</li> <li>4. All wires/hoses/tubes etc. are fastened properly to protect integrity and prevent wire chafing.</li> <li>5. Ring terminals or crimps/set screws are used on all high voltage connections.</li> </ol>
Structural Design	<ol style="list-style-type: none"> <li>1. The Genset is designed to withstand &amp; operate satisfactorily in over-the-road trucking, railway operations, &amp; aboard ships.</li> <li>2. The Genset is rated to withstand all shock and vibrations experienced over the life of the genset. The Genset is designed to have no harmful resonance frequencies below 30Hz.</li> </ol>
Structural Frame	<ol style="list-style-type: none"> <li>1. Structural steel frame is cleaned through a 2 stage mechanical pretreatment (sandblast) and 6-stage chemical pretreatment with a multi-metal iron phosphate passivation, and coated with a Black polyester TGIC powder (2.5 - 4) mils.</li> </ol>
Panels and Doors	<ol style="list-style-type: none"> <li>1. Panels and doors are chemically cleaned through a 6-stage pretreatment line with a multi-metal iron phosphate passivation and top coated with white polyester (2.5-4.0) mils TGIC (triglycidyl isocyanurate) powder.</li> <li>2. Door material: Aluminum, .100" (2.54mm) thick</li> <li>3. Panel material: Aluminum, .063" (1.60 mm) minimum thickness</li> </ol>
Hardware	All hardware are stainless steel for maximum protection from salt water corrosion.
Nameplate Instructions	English and Spanish language operating instructions
CE Compliance	Compliant with the Machinery Directive 89/392/EEC amending Directive 91/368/EEC, Electro Magnetic Compatibility Directive 89/336/EEC, and Low Voltage Directives 73/23/EEC and 93/68/EEC.
Ambient Temperature Range	Starting: -26°C to 50°C (-15°F to 122°F) Running: -29°C to 50°C (-20°F to 122°F)
Output Power Rating	18kW Designed to supply operating power for container refrigeration units complying with ISO 1496-2
Sound Pressure Level	74 dBA. 5 point average at 7m
Dimensions	Width: 1524 mm (60.0 in) Height: 800 mm (31.5 in) Depth: 1334 mm (52.5 in)
Weight	658 kg (1450 lbs) – Total Weight, including Gen Set, oil, coolant, dry fuel tank and battery. Genset to be provided with decal indicating gross weight inclusive of fuel.
Chassis Mounting	The genset mounting arrangement will accommodate 254 mm (10 in) and 305 mm (12 in) I-beam type chassis. The angles are attached to the I-beam via four (4) cast ductile steel mounting clips, ¾-16 bolts, and locking nuts. The mounting clips and attachment positions on the steel angles will accommodate chassis I-beam spacings of 914 mm (36 in) or 965 mm (38 in) centers. The mounting clips are extremely versatile and will accommodate high tolerance I-beam spacings and flange widths.

# Product specifications

## ENGINE

Type	TK 486VG direct injection
Cylinder Arrangement	No. 1 at flywheel end
Bore	86 mm (3.39 in) nominal
Displacement	2.09 liter (128 in <sup>3</sup> )
Horsepower	30.1hp, (22.5kW)
Oil Pressure (hot)	More than 127 kPa (18.5 psi) @ 1800 rpm
Oil Base (Pan) Capacity	12.3 liters (13 quarts)
Engine Rotation	Clockwise (viewed from pulley end)
Engine Water Pump	Pulley ratio 1.3 to 1
Protection	Low oil level and high coolant temperature
Serviceability	Starter motor/injector pump mounted on front side of engine
Paint	Thermo King Grey Pinnacle 460 Urethane
Timing System	Gear drive for camshaft and injection pump
Firing Order	1-3-4-2
Compression Pressure	More than 2942 kPa (427 psi) @ 250 rpm
Nozzle Injection Pressure	21600-22600 kPa (3100 – 3300 psi)
Emission	NRMM Stage III A compliant

## ENGINE LUBRICATION SYSTEM

Oil Pump Type	Trochoid
Oil Type	API CI grade -- Use straight or multi-weight oils appropriate for the ambient temperature (delivered with 10W30 oil)
Oil Change Interval	Consult applicable service manual
Delivery Volume	15.7 liters (4.15 gallons) / min @ 1000 pump rpm
Oil Filters Full Flow: Dual lube Full flow/bypass filter	Thermo King Part # 11-9182

## FUEL SYSTEM

Fuel Tank	50 Gallon Aluminum Tank that meets U.S. Federal Motor Carrier Safety Administration (FMCSA) requirements for non-side mounted tanks with special markings.
Automatic Air Bleed System	Thermo King furnishes a patented air removal system for purging air from the injector pump and fuel supply lines. The air bleed system works whether the generator set is operating or shutdown. In the case of long shutdown periods, the automatic air bleed system insures sufficient air free fuel available to the injectors to successfully start the engine without manually bleeding the lines and injector assembly.
Tightening Torque	41 N-m (27.5 ft-lb)
Nozzle Type	YDM-PD
Fuel Tank Mounting	Integral with genset frame on steel support members that are bolted to the genset frame.
Fuel Tank Drainage	Supplied with a drain plug in the bottom of the tank for purging contaminants.
Fuel Filters	Thermo King's self-evacuating filter (SEF) is both a fuel filter and a water separator in one spin-on canister.
Anti-Siphon	Rated at 30GPM
Transfer Pump Lobe Lift	5.0 mm (0.197 in)
Injection Pump Rotation	Clockwise (viewed from gear end)
Injection Timed at	See Maintenance Manual
Injection Lines, ID	1.4 mm (0.055 in)
Injection Lines, OD	6 mm (0.236 in)

# Product specifications

## GENERATOR

Type	Synchronous type generator consisting of a 4 pole alternator wound field design with brushless exciter
Maximum Temperature Rise	105 °C in accordance with NEMA Standard MG 1-22.40
Varnish Treatment – Generator Stator & Exciter Stator	Double Vacuum Pressure Impregnated with polyester resin, top coated with EG43 grey varnish. Exposed windings brushed with black poly-butylene.
Rear Bearing	Single bearing, 6307. Double contact sealed, including a medium fill of Mobil 28 grease.
Insulation	Class H per NEMA Standard MG-1-1.65
Method of Cooling	Drive disc radial fan
Varnish Treatment - Rotor	Double Vacuum Pressure Impregnated with polyester resin, top coated with EG43 varnish.
Engine Flywheel Housing	Cast steel housing. Cast surfaces are machined for the mounting bolts.
<b>Generator Rating (Nominal)</b>	
Output Power	21 kW
Kilovolt-Amperes	26.25 kVA
Power Factor	0.8
RPM	1800
Voltage	460 / 230
Phases	3
Frequency	60 Hz

## HOSES

Intake Air Hose	High temperature EPDM with internal spring
Coolant Hoses	High temperature EPDM

## ELECTRICAL POWER RECEPTACLE

Type	IEC 60309
Current Limit	32 Amps
Voltage	3ph 460 V
Protection	Spring loaded water/dirt protection cover

## RADIATOR COIL

Protection	E-coat coating for corrosion resistance or equivalent
Fin Space	2.54 mm (0.100 in)
Pipe Material, Copper	According to DIN 1787 wall thickness 0.762 mm (0.030 in)
Surface Area	9.44 m <sup>2</sup> (101.6 ft <sup>2</sup> )
Tube Material	Copper, internally cross-hatched.
Fin Material	Aluminum
Configuration	Vertical
Coolant Fluid	Caltex coolant – equivalent of Texaco ELC #16445 & rated to -40°C (-40°F) or equivalent

## BATTERY

Type	Maintenance free 12 VDC
Recharging	Solid-state battery charging, 26 Amps output integrated into SG+ controller.
Cold Cranking Amps	925 Amps at -18°C (0°F)
Terminal Posts	Round post terminals and standard battery cable connections are provided
Dimensions	330 x 173 x 238 mm (13 x 6.8 x 9.4 in)

# Product specifications

## SG+ MICROPROCESSOR CONTROLLER DESCRIPTION

The SG+ Microprocessor Controller is a one-piece self contained microprocessor for diesel generator sets. This system automatically controls the generator set operation by providing:

- Ability to operate genset at variable speeds for enhanced fuel consumption
- Automatic unit preheat and engine start-up during initial start-up or unattended restart
- Variable air intake heater preheat time
- Automatic Pre-Trip capability
- Provides unit shutdown protection due to high engine coolant temperature, low engine oil pressure, low engine oil level, fuel relay feedback failure or 230/460V alternator overload
- Automatic unit restart attempt 20 minutes after:
  - High engine water temperature
  - Engine failure to start
  - Check fuel alarm
  - 230/460V alternator overload
  - Fuel relay feedback failure
- Exterior Deutsch downloading port with protective cap provided.
- Low engine oil pressure
- Delayed alternator excitation for 15 seconds, or until engine coolant temperature increases to 32°C (90°F) (selectable)
- Internal self-checking /diagnostic capability
- Hourmeter
- Multi language menu capability

## SG+ CONTROLLER INTERFACE

The SG+ controller interface contains the following features and components:

**A. LCD Digital Display**

**B. Alarm LED**

**C. Power LED**

<b>D. Six keypad keys</b>	1. "Escape" use escape to move back to previous selection, or exit from current menu
	2. "Up" use to scroll up through the menu display, or increase the value of a setting
	3. "Down" use to scroll down through the menu display, or decrease the value of a setting
	4. "Enter" use to enter or execute controller menu tasks or commands
	5. "Alarm" use to go directly to the alarm list menu and view the alarm information in the display
	6. "Language" use to change the display language. English and Spanish are currently available

**E. Unit On/Off switch**

**F. Download port**



### Microprocessor Inputs:

- Engine oil pressure
- Alternator voltage
- Battery voltage
- Engine coolant temperature
- Air filter switch
- Coolant level sensor
- Engine oil pressure switch
- Engine oil level sensor
- Air heater (preheat) feedback
- Fuel pull relay feedback
- Fuel hold relay feedback
- Excitation feedback
- Flywheel sensor

### Microprocessor Outputs:

- Start relay
- Preheat relay
- Fuel pull relay
- Fuel hold relay
- On light
- Alarm light

### Display Menus

1. Data Menu
  - Analog inputs
  - Digital inputs
  - Digital outputs
  - Internal states
2. Alarm list menu
3. Message list menu
4. Commands menu
  - PTI
  - Manual function test
5. Misc. functions menu
  - Date/time
  - °C/°F mode
  - Program version
  - Timers/counters
6. Configuration menu
7. Event log menu

# Product specifications

## OPTIONS

### Customer specified color

The frame assembly and panels can be painted per customer request but must be noted in advance.

### Customer unit serial number decals

Customer decals can be included per customer request but must be noted in advance.

### Fuel heater

150 W electric fuel heater

### Fuel Pre-filter

Cleanable fuel strainer placed in the supply line between fuel tank and transfer pump on the engine. Prevents clogging of the fuel pump inlet screen and also to facilitate visual inspection during pre trip inspection.

### Fuel tank

80 Gallon fuel tank

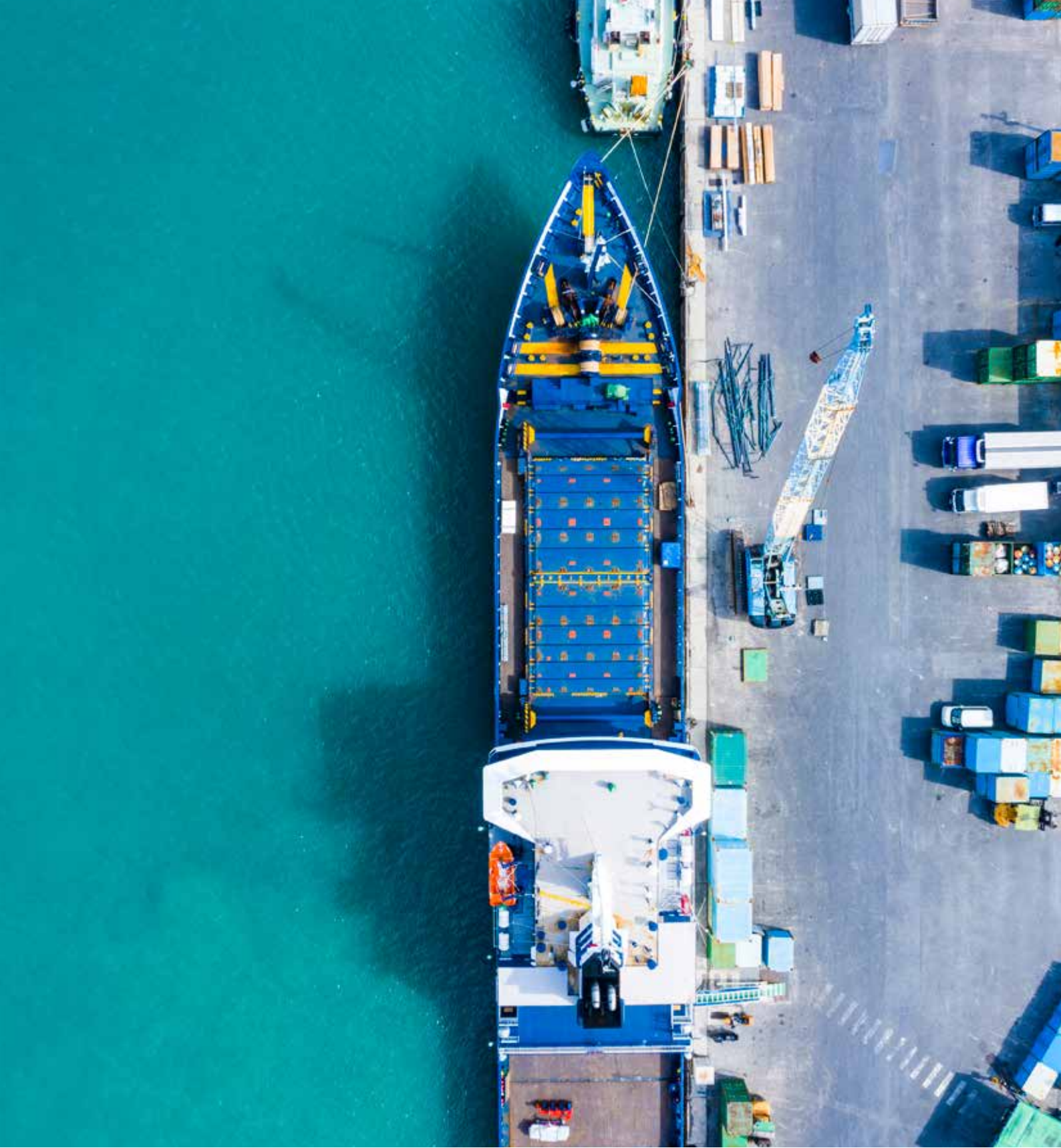
### Battery

Threaded stud post battery terminals

### Fuel monitoring

Capable of logging any event which causes changes in fuel levels outside of the range of normal genset operations.





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