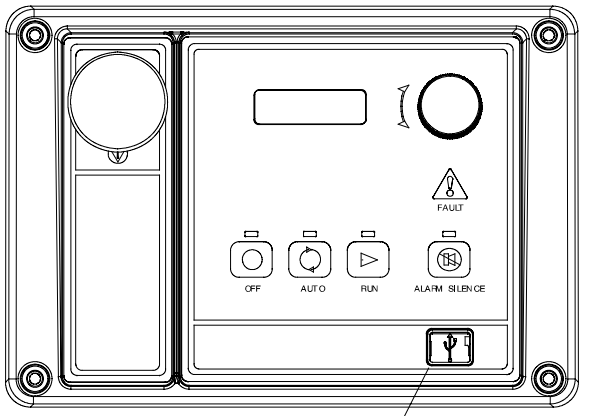
INSTALLATION INSTRUCTIONS

Original Issue Date: **6/10**
Model: **20–300 kW Generator Sets**
Market: **Industrial**
Subject: **Decision-Maker® 3000 Controller Service Replacement Kit GM75376**

Introduction

The controller service replacement kit is available to replace a non-functional controller. Use the following procedure to install the replacement controller. See Figure 1 for typical controller identification. For features and operation of the controller, see the operation manual in the literature kit.



1. Mini USB connection

Figure 1 Decision-Maker® 3000 Controller

Note: Do not use this controller replacement installation instruction for upgrading software.

When replacing the controller, the following data must be resident for the controller to function. Controller service replacement kits do not include the three files installed at the factory. The service technician *must* install the three files into the replacement controller.

- **Application program** contains the software that controls system operation. The application file was preprogrammed in the *original* controller at the factory.

- **Personality profile** is specific to the engine and alternator and was preprogrammed in the *original* controller at the factory.

  A backup disk of the personality profile and application program is supplied with the literature packet shipped with the generator set. Typically, the distributor stores this disk for possible future use such as controller replacement or other circumstances requiring a backup.

  Note: If the personality disk is NOT available, request a replacement from the manufacturer using the generator set serial number or order number.

- **User parameters** unique to an installation include timer values, setpoints, generator set data such as voltage and input/output selections. These parameters are typically set up for or by the installer at the time of installation. User parameters are typically recorded on the personality profile disk, a separate backup disk/drive, or written in the Programmer-Defined Settings appendix in the controller operation manual. *A copy of the Programmer-Defined Settings form is included at the end of this document.*

Note: If the user parameters are included on the personality disk, the disk label should indicate Site Program—Yes.

Read the entire installation procedure and compare the kit parts with the parts list in this publication before beginning installation. Perform the steps in the order shown.

Always observe applicable local and national electrical codes.

Note: The following service kit procedure changes only the controller. If the generator set requires voltage reconnection and/or frequency adjustment, see the controller operation manual TP-6694.

Installation Requirements

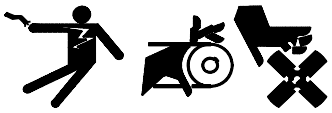
The following items are necessary PC requirements for installing the controller service replacement kits.

- **SiteTech™ Software Version 2.0 or higher** from KOHLER*net* using the TechTools button to download on your PC hard drive or disk if not already installed on your PC.
- **TP-6701 SiteTech™ Software Operation Manual** available from KOHLER*net* using the TechTools button.
- **USB Cable** with male USB-A and mini-B connectors. See TP-6701.

Safety Precautions

Observe the following safety precautions while installing the kit.

⚠ WARNING

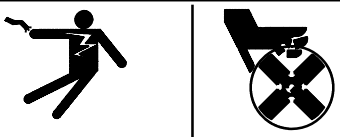


Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

⚠ WARNING



Hazardous voltage. Moving rotor.
Can cause severe injury or death.

Operate the generator set only when all guards and electrical enclosures are in place.

Grounding electrical equipment. Hazardous voltage can cause severe injury or death. Electrocution is possible whenever electricity is present. Open the main circuit breakers of all power sources before servicing the equipment. Configure the installation to electrically ground the generator set and related equipment and electrical circuits to comply with applicable codes and standards. Never contact electrical leads or appliances when standing in water or on wet ground because these conditions increase the risk of electrocution.

Connecting the battery and the battery charger. Hazardous voltage can cause severe injury or death. Reconnect the battery correctly, positive to positive and negative to negative, to avoid electrical shock and damage to the battery charger and battery(ies). Have a qualified electrician install the battery(ies).

Short circuits. Hazardous voltage/current can cause severe injury or death. Short circuits can cause bodily injury and/or equipment damage**.** Do not contact electrical connections with tools or jewelry while making adjustments or repairs. Remove all jewelry before servicing the equipment.

Installation Procedure

1. Acquire the user parameters.

1.1 Choose one of the following methods to retrieve the user parameters:

- Backup disk. If a backup disk was previously made, obtain the parameters from this disk. If a disk was not previously made, create a backup if possible using the SiteTech™ software. The existing controller must function in order to create the file.
- Paper form. Parameters may have been previously recorded on the User-Defined Settings form located in the appendix of the Decision-Maker® 3000 Controller Operation Manual TP-6694 or other similar form.
- Controller menu. Manually review the controller menu displays if possible and enter the parameter information in the Decision-Maker® 3000 Controller Operation Manual TP-6694 appendix, Programmer-Defined Settings form.

1.2 Save the user parameter data for step 6.3.

2. Remove the generator set from service.

2.1 Press the generator set master control OFF/RESET button.

2.2 Disconnect the power to the battery charger, if equipped.

2.3 Disconnect the generator set engine starting battery(ies), negative (-) lead first.

2.4 Disconnect the generator set from load by opening the line circuit breaker.

3. Remove the existing controller and disconnect the electrical connections.

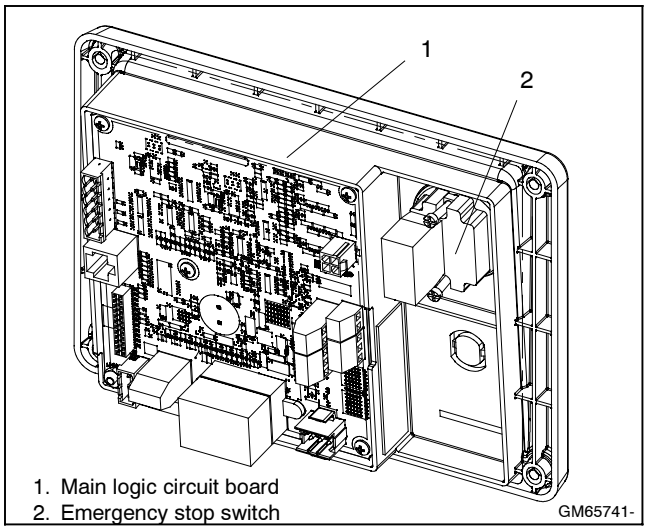
3.1 Remove the junction box panels as needed to access the wiring.

3.2 Remove the four controller panel screws.

Note: Clearly mark all disconnected leads from the controller with tape to simplify reconnection.

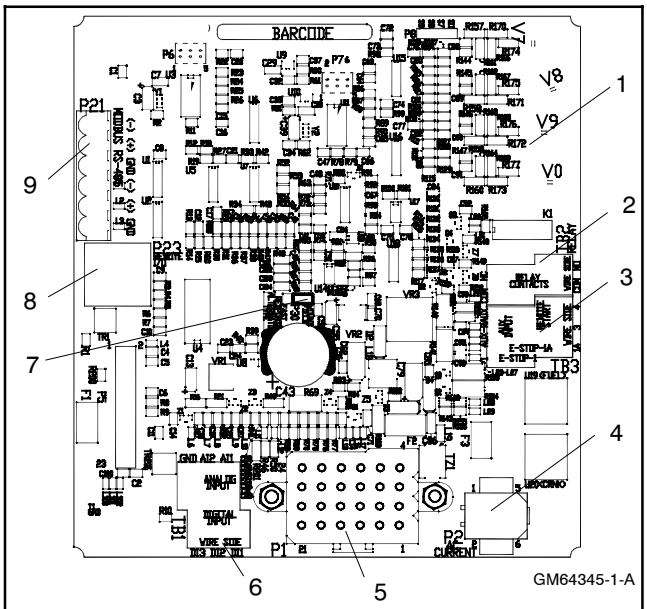
3.3 Disconnect the controller harness leads. Listed below are some common leads and plugs that require removal or disconnection. Items below in **bold** are shown in Figure 2 and Figure 3. These connections are typical and may not apply to all applications. See the corresponding wiring diagram found in the respective wiring diagrams manual.

- **Remote Emergency Stop Switch** connections.
- **P1 (24-Pin) Connector** for engine/ generator wiring harness.
- **P2 (6-Pin) Connector** for AC current. P2 is only used with the GM65741 controller (GM64345 board). The GM65741-1 controller (GM64345-1 board) has the AC current wiring included in the P1 connector.
- **(4) Push-on Terminal Connectors** for V7/V8/V9/V0 for generator set output voltage connection.
- **P21 (6-Pin) Connector** for RS-485 connection of optional RSA.
- **P23 (8-Pin) Connector** (RJ45) for optional input/output (I/O) module circuit board.
- **P30 3-Pin Connector (2-Pin Jumper)** for selection of alternator type—Wound Field (300 kW and larger) or Fast Response (less than 350 kW). Take note of the original circuit board jumper position. See Figure 4.
- **TB1 (6-Position) Terminal Block** for analog and digital inputs.
- **TB2 (4-Position) Terminal Block** for K1 relay outputs.
- **TB3 (6-Position) Terminal Block** for E-stop, remote start contacts, and aux. input connections.
- Any other external leads to the controller



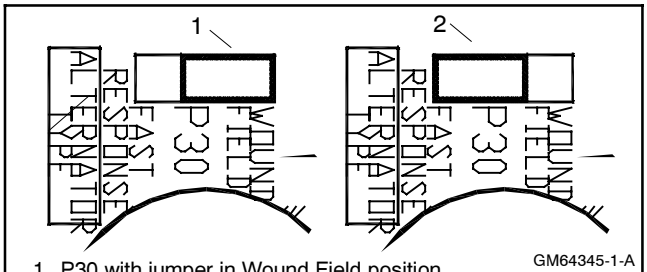
1. Main logic circuit board
2. Emergency stop switch

Figure 2 Main Circuit Board and E-Stop Switch



1. (4) push-on terminal connectors
2. TB2 4-position terminal block
3. TB3 6-position terminal block
4. P2 6-pin connector (only used with GM65471 controller, GM64345 board)
5. P1 24-pin connector
6. TB1 6-position terminal block
7. P30 jumper (Wound Field or Fast Response)
8. P23 8-pin connector (RJ45)
9. P21 6-pin connector (for RS-485 communication)

Figure 3 Main Circuit (Blue) Board Connectors



1. P30 with jumper in Wound Field position
2. P30 with jumper in Fast Response position

Figure 4 P30 3-Pin Connector and 2-Pin Jumper

4. Reconnect the electrical connections and install the replacement controller.

4.1 If the generator set wiring includes a P2 plug, connect the P1 and P2 plugs into adapter harness GM86898 and then connect the adapter harness plug to the controller P1 connector. See Figure 6.

If the generator set wiring does not have a P2 plug, the adapter harness GM86898 is not used. Connect the generator set wiring P1 plug directly to the controller P1 connector.

4.2 Reconnect all of the remaining electrical connections disconnected in step 3.3. Refer to Figure 2 and Figure 3.

4.3 Place the P30 jumper in the appropriate position based on the alternator. Wound Field (300 kW and larger) or Fast Response (less than 350 kW). The wound field position is the factory default. Refer to the original circuit board jumper position and see Figure 5.

Note: P30 is only available on main circuit board (GM64345-1 blue board). GM64345-1 is interchangeable with the earlier GM64345 green board. GM64345 green board is NOT interchangeable with GM64345-1 blue board.

Alternator Type	P30 Position
4P, 4Q, 4S, 4UA, 4V	Fast Response
4PX, 4QX, 4RX, 4SX, 4TX	Fast Response
4M, 5M, 7M	Wound Field

Figure 5 P30 Jumper Positions

4.4 Align the controller panel with the mounting holes and install four screws.

4.5 Replace the junction box panels if previously removed.

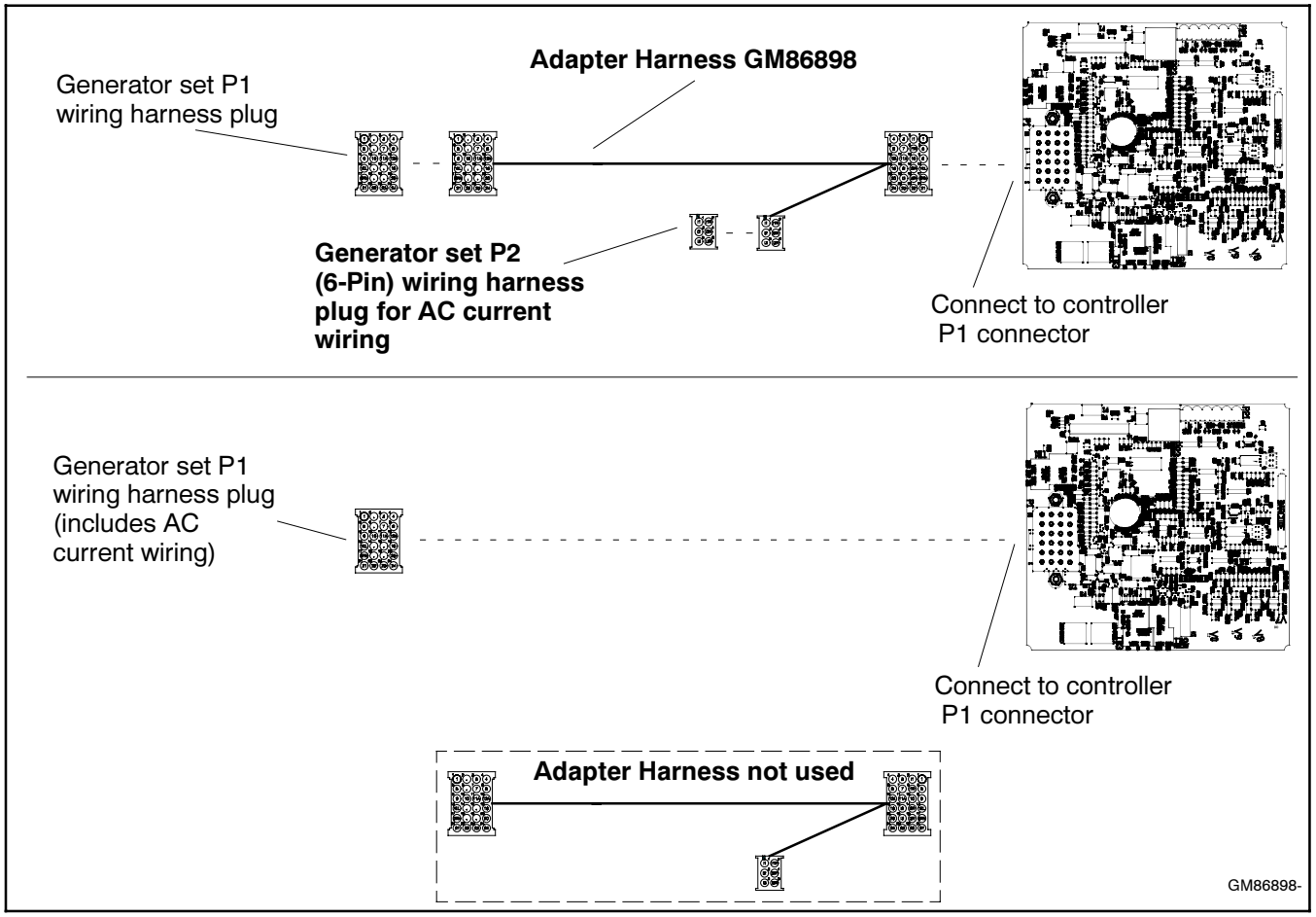


Figure 6 Adapter Harness GM86898 Application

5. Restore power to the generator set.

5.1 Reconnect the generator set engine starting battery, negative (–) lead last.

5.2 Reconnect power to the battery charger, if equipped.

6. Set the device profile.

6.1 Connect the PC to the Decision-Maker® 3000 controller using a USB cable. See Figure 1 for the location of the USB connection port.

6.2 Insert the personality profile backup disk/drive and load the data. Refer to Tech Tools—Software and TP-6701 SiteTech™ Software Operation Manual for details.

6.3 Choose one of the following methods to load the user parameters.

- Backup disk/drive. Use a PC with SiteTech™ software to load the data from the user parameter backup disk/drive.
- Paper form. Use a PC to enter the user parameter data from the filled-out Decision-Maker® 3000 Controller Operation Manual TP-6694 appendix, the Appendix A–Programmer-Defined Settings form located at the end of this document, or other similar form.

6.4 Create a new user parameter data backup disk/drive if any changes are made using SiteTech™ software. Refer to TP-6701 SiteTech™ Software Operation Manual for details.

6.5 Disconnect the USB cable.

6.6 Power down the unit by using the prime power switch (if equipped) or by disconnecting the battery negative (–) terminal.

6.7 Wait at least 15 seconds and then power up the unit by using the prime power switch (if equipped) or by reconnecting the battery negative (–) terminal.

6.8 Refer to the Decision-Maker® 3000 Operation Manual TP-6694. Calibrate the generator set as instructed in 2.6.4 Generator Metering.

6.9 Press the RUN button to start the generator set.

6.10 Test the functionality of the controller by reviewing the menus and observing the system status lamps. Use the Operation Manual as needed.

6.11 Press the OFF button to stop the generator set after completing the test.

6.12 Reconnect the generator set to load by closing the line circuit breaker.

6.13 Press the generator set master control AUTO button for startup by remote transfer switch or remote start/stop switch.

Parts List

Controller Service Replacement Kit

Kit: GM75376		
Qty.	**Description**	**Part Number**
1	Controller assembly	GM65741-1
1	Programming shunt (2-pin jumper)	294634
1	Harness, adapter	GM86898

Appendix A Programmer-Defined Settings

Use the table below to record programmer-defined settings during the generator set controller setup and calibration. The controller default settings and ranges provide guidelines. The table contains all faults with ranges and time delays including items that do not have adjustments. Some notices give the programmer a choice to make them active Not adjustable programmer-defined settings result when the controller logic does not allow changes or the values are engine limited.

SiteTech™ software is required for programming the Decision-Maker® 3000 controller. Contact your local distributor/dealer for assistance.

Note: Inhibit time delay is the time delay period after crank disconnect.

Note: The engine ECM may limit the crank cycle even if the controller is set to a longer time period.

Programmer-Defined Settings

Description	Controller Display Message	Write Access Display SiteTech	GenSet Mode Always Running Stopped	Range Setting	Default Selection	Time Delay Range (sec.)	Default Time Delay (sec.)	Programmer-Defined Settings
Engine Functions								
Critically high fuel level (diesel-powered models only) *	Fuel Level Critically High			0-100%	95%	0-10	5	
ECM communications loss	ECM Comm Err Shutdwn					Fixed	10	Not adjustable
ECM diagnostics (multiple inputs) †	ECM xxxxxx Warning							Not adjustable
ECM diagnostics (multiple inputs) †	ECM xxxxxx Shutdwn							Not adjustable
ECM faults (address conflict)	ECM Addr Err Shutdwn							Not adjustable
ECM faults (model mismatch)	ECM Mismatch Shutdwn			0-255	0			
Engine over speed	Eng Speed High Shutdwn	S	A	105-120%	115%			
Engine start aid active	Starting Aid Notice							
Engine under speed	Eng Speed Low Shutdwn	S	A	75-95%	85%			
Fuel tank leak *	Fuel Leak Warning							Not adjustable
Fuel tank leak *	Fuel Leak Shutdwn							Not adjustable
High battery voltage	Battery High Warning	S	A	110-135%	125%	Fixed	10	Not adjustable
High coolant temperature	CoolInt Temp High Warning					0-10 (0-30 inhibit)	0 (0 inhibit)	
High coolant temperature	CoolInt Temp High Shutdwn					0-10 (0-30 inhibit)	0 (0 inhibit)	
High fuel level (diesel-powered models only) *	Fuel Level High Warning			0-100%	90%	0-10	5	
Low battery voltage	Battery Low Warning	S	A	80-105%	100%	Fixed	90	Not adjustable
Low coolant level *	Coolant Lvl Low Shutdwn					Fixed	5	Not adjustable
Low coolant temperature	Coolant Temp Low Warning			Fixed	16°C (60°F)	0-10 (0-30 inhibit)	5 (0 inhibit)	
Low cranking voltage	Lo Crank Vlt Warning			Fixed	60%	Fixed	6	Not adjustable
Low engine oil level *	Oil Level Low Warning							Not adjustable
Low engine oil level *	Oil Level Low Shutdwn							Not adjustable
Low fuel level (diesel models) *	Fuel Level Low Warning			0-100%	35%	0-10	10	
Low fuel level (diesel models) *	Fuel Level Low Shutdwn			0-100%	5%	0-10	0	

Description	Controller Display Message	Write Access Display SiteTech	GenSet Mode Always Running Stopped	Range Setting	Default Selection	Time Delay Range (sec.)	Default Time Delay (sec.)	Programmer-Defined Settings
Low fuel pressure (gas models) *	Fuel Press Low Warning							Not adjustable
Low oil pressure	Oil Press Low Warning					Fixed (Fixed inhibit)	0 (30 inhibit)	Not adjustable
Low oil pressure	Oil Press Low Shutdwn					Fixed (Fixed inhibit)	5 (30 inhibit)	Not adjustable
No coolant temperature signal	Temp Sig Loss Shutdwn							Not adjustable
No oil pressure signal	Press Sig Loss Shutdwn					Fixed	5	Not adjustable
Overcrank	Over Crank Shutdwn					Fixed	(30 inhibit)	Not adjustable
Speed sensor fault	Spd Sens Flt Warning							Not adjustable
General Functions								
Alarm silence, 0–Auto only (NFPA 110), 1–Always	AlarmSilenceMode	S	A	0–1	1			
Aux. inputs 0–5 VDC, 1 analog	Aux Input Warning			0–100%	100%	0–10	0	
Aux. inputs 0–5 VDC, 1 analog	Aux Input Shutdwn			0–100%	100%	0–10	0	
Auxiliary inputs, up to 3 digital (2 additional digital inputs available with I/O module option)	Aux Input Warning					0–10 (0–30 inhibit)	0 (0 inhibit)	
Auxiliary inputs, up to 3 digital (2 additional digital inputs available with I/O module option)	Aux Input Shutdwn					0–10 (0–30 inhibit)	0 (0 inhibit)	
Backup parameters loaded	Backup Pars Status							Not adjustable
Battery charger fault *	Batt Chg Flt Warning							Not adjustable
Chicago code active *	Auto Locked Notice							
Common fault (includes ⏚)	Common Fault Shutdwn							Not adjustable
Common warning fault	Common Warng							Not adjustable
Default parameters loaded	Default Pars Warning							Not adjustable
Emergency stop	Emerg Stop Shutdwn							Not adjustable
Engine cooldown (delay) active	Eng Cooldown Notice							
Engine start delay active	Start Delay Notice							
Engine started	Engine Start Status							Not adjustable
Engine stopped	Engine Stop Status							Not adjustable
EPS supplying load	Emerg Pwr On Notice							Not adjustable
File system error (controller fault)	File Error Shutdwn							Not adjustable
Generator running	Gen Running Notice							Not adjustable
Input/output (optional module board) communication loss	OB1 Com Loss							Not adjustable
Internal failure	Intern Error Shutdwn							Not adjustable
Measurement Units, 0–English, 1–Metric	Measurement Display	DS	A	0–1	1			
Metering communication loss	MeterCommLos Shutdwn							Not adjustable
NFPA 110 alarm active	NFPA Alarm Notice							
Not in auto (master control buttons)	Not In Auto Warning							Not adjustable
Prime power application, 0–Standby, 1–Prime	Power Type	DS	A	0–1	0			
Remote start	Remote Start Status							Not adjustable

Description	Controller Display Message	Write Access Display SiteTech	GenSet Mode Always Running Stopped	Range Setting	Default Selection	Time Delay Range (sec.)	Default Time Delay (sec.)	Programmer-Defined Settings
System ready	System Ready Status							Not adjustable
System timer failed	Timer Error Notice							Not adjustable
Generator Functions								
AC sensing loss	AC Sens Loss Warning							Not adjustable
AC sensing loss	AC Sens Loss Shutdwn					Fixed	3	Not adjustable
Alternator protection	Alt Protect Shutdwn							Not adjustable
Ground fault input *	Ground Fault Warning							Not adjustable
kW overload	Total Power High Shutdwn			Fixed	102% standby, 112% prime	Fixed	60	Not adjustable
Locked rotor (failed to crank)	Locked Rotor Shutdwn	S	A			1-5	5	
Overfrequency	Freq High Shutdwn			102-140%	110%	Fixed	10	Not adjustable
Overvoltage (each phase)	Volts (L1-L2, L2-L3, or L3-L1) High Shutdwn	S	A	105-135%	120%	2-10	2	
Power rating	Pwr Rating	DS	S	10-5000	275			
System frequency	System Freq	DS	S	50-60	60			
System voltage	System Volt	DS	S	110-600	208			
Underfrequency	Frequency Low Shutdwn			80-95%	90%	Fixed	10 ST 60 LT	Not adjustable
Undervoltage (each phase)	Volts (L1-L2, L2-L3, or L3-L1) Low Shutdwn	S	A	70-95%	80%	5-30	10	
Voltage/phase configuration, 0-Single phase, 1-Single phase dogleg, 2-three phase wye, 3-three phase delta	SystemPhase	DS	S	0-3	2			
Voltage regulator average voltage adjustment	VR Volt Adj	DS	R	108-600	208			
(Voltage) regulator communication loss	RegCommLoss Shutdwn							Not adjustable
SiteTech Read/Write Display Only								
Current transformer ratio		S	S	1-	1200			
ECM power		S	S	0-1	0			
Engine cooldown delay		S	A			0-600	300	
Engine (cyclic) crank on		S	A			10-30	15	
Engine (cyclic) crank pause		S	A			1-60	15	
Engine ECM start delay		S	A			0-300	0	
Engine idle duration		S	A			0-60	60	
Engine no. of (cyclic) crank cycles		S	S	1-6	3			
Engine restart delay		S	A			1-10	10	
Engine start aid delay		S	A			0-10	0	
Engine start delay		S	A			0-300	0	
System battery voltage		S	S	12-24	12			
Voltage regulator gain		S	R	1-255	128			
Voltage regulator stability adjust		S	R	1-255	128			
Voltage regulator, volts per Hertz slope		S	R	1-10	5			
Voltage regulator, volts per Hertz cutin frequency		S	R	42-62	57.5			

* Some functions require optional input sensors or are engine ECM dependent on some generator set models.

† ECM inputs are engine manufacturer dependent.

‡ Common fault shutdown includes engine over speed, high coolant temperature, low oil pressure, overcrank, and emergency stop.

ST-Short Term, LT-Long Term