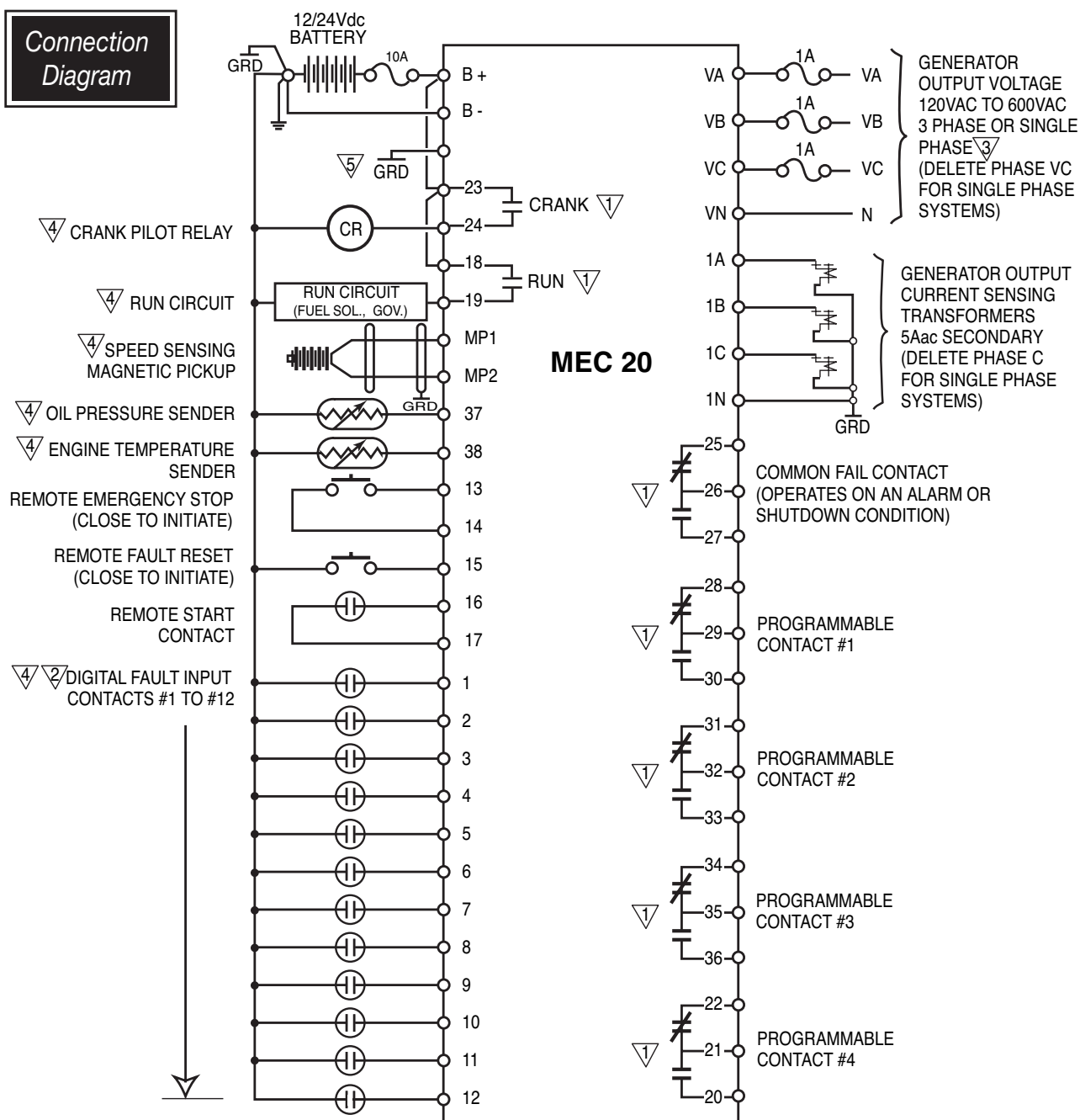


## Connection Diagram



### NOTES:

- 1** CONTACTS RATED MAXIMUM 10A/240VAC, 8A/24Vdc RESISTIVE
- 2** LOGIC IS SOFTWARE PROGRAMMABLE FOR OPEN OR CLOSE ON FAIL
- 3** GENERATOR SUPPLY MUST UTILIZE A SOLIDLY GROUNDED NEUTRAL SYSTEM—REFER TO INSTRUCTION MANUAL FOR ALTERNATE CONNECTIONS
- 4** ENGINE MOUNTED COMPONENTS
- 5** "GRD" CONNECTION TO BE MADE TO COMMON CHASSIS/ENCLOSURE GROUND BOND SYSTEM

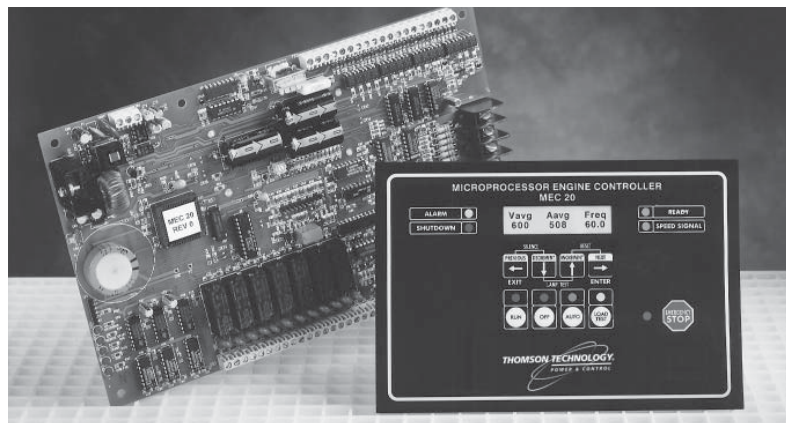
**NOTE:** Specifications subject to change without notice.

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## MICROPROCESSOR ENGINE/GENERATOR CONTROLLER



- Microprocessor-based circuitry provides ultimate reliability and versatility
- Standard features meet or exceed requirements as defined by NFPA 110 Level 1 and CSA C282
- Backlit LCD display screen with alpha-numeric readout for display and programming
- Digital 3-phase voltage, 3-phase current, KVA and frequency metering for generator output
- Up to 28 alarm/shutdown fault circuits utilizing analog and digital inputs
- Standard RS422 remote communication serial port
- Alarm/shutdown indications are displayed in plain English language
- Optional expansion output module for individual fault output contacts
- Password protected programming levels
- Self diagnostic features continuously verify processing, I/O and memory circuits
- Superior EMI/RFI noise immunity and surge performance features as per IEEE C62.41
- Certified to UL #508 and CSA 22.2 #14 Industrial Control Equipment Standards

### GENERAL DESCRIPTION

The Thomson Technology **MEC 20 Microprocessor-based Engine/Generator Controller** utilizes the latest advancements in microprocessor technology, printed circuit board assembly techniques and software development. This is the eighth generation of engine controllers from Thomson Technology, and reflects over 25 years of engine controller design experience, including a decade utilizing microprocessors. The result is an automatic engine/generator controller of superior design, providing a comprehensive array of operational, protection and display features. All functions of the **MEC 20** are fully configurable from the front panel keypad, and are password protected. The LCD display screen prompts are in plain English, providing a user-friendly operator interface with many display options available. The microprocessor design provides high accuracy for all voltage monitoring, current monitoring and timing functions as well as providing many standard features which are commonly available only as expensive add-on optional features on competitors' products.

## STANDARD FEATURES ▲

- **Alpha-Numeric Readout:** Display and programming
- **Digital AC Metering:** 3 phase voltage (phase to phase and phase to neutral)▲, 3 phase current, KVA, frequency
- **Digital Engine Gauge Display:** Oil pressure, Engine temperature, Battery Voltage, Hourmeter, Tachometer
- **28 Standard Fault Circuits:**

Shutdowns	Alarms
• Over Crank	• Under Frequency
• Under Voltage	• Over Frequency
• Over Voltage	• Over Current
• High Engine Temperature ▲ ▲	• Weak Battery
• Low Oil Pressure ▲ ▲	• Low Battery Voltage
• Over Speed	• High Battery Voltage
• Loss of Speed Signal	• Battery Charger Fail ▲
• Emergency Stop	• Low Engine Temperature
	• High Engine Temperature
	• Low Oil Pressure
	• Low Fuel Level ▲
	• Switch Not in Auto
	• Digital Faults #5-#12 ▲
	(User programmed)

- **Timers:** Engine Start, Cooldown, Oil Bypass, Over Crank, Cycle Crank
- **Control Switches:** Run/Off/Auto/Load Test, Horn Silence, Lamp Test, Fault Reset
- **Emergency Stop:** Faceplate mounted push-button and provision for remote contact input
- **LCD Display Menus:** AC metering, timer countdown functions, alarm/shutdown indication, engine parameters
- **LED Indicators:** Switch position (run, off, auto, load test), Common alarm, Common shutdown, Ready, Speed signal, Emergency stop
- **AMF (Auto Mains Failure):** Control outputs and timers to control external transfer mechanism
- **Diagnostic LED Indicators:** Watchdog (CPU running), run output energized, crank output energized, remote start signal initiated, common fail output energized
- **Audible Alarm Horn:** Programmable continuous or auto silence feature
- **Run & Crank Output Contacts:** (10A/240VAC, 8A/24Vdc, Form A)
- **Common Fail Output Contact:** (10A/240VAC, 8A/24Vdc, Form C)
- **4 Programmable Output Contacts:** (10A/240VAC, 8A/24Vdc, Form C): User configured function (refer to programming functions available)
- **Provision for Remote Contact Inputs:** Emergency Stop, Remote Reset
- **Engine Senders:** Oil pressure (1/8" NPT), Temperature (1/4" NPT) supplied loose for engine mounting
- **COM** MEC 20 remote communication port (RS422). Can be used in conjunction with external TT Communication Interface Module (CIM module not included).\*

▲ Standard features meet or exceed requirements as defined by NFPA 110 Level 1 & CSA C282.

▲ Requires customer-supplied sensing contact.

▲ For CSA C282 applications, Battery Charger Input Fail alarm is reconfigurable as Low Coolant Level Shutdown.

▲ Generator supply must utilize a solidly grounded neutral system for standard panel connections.

▲ High Engine Temperature and Low Oil Pressure shutdowns are factory programmed to utilize both digital contact and analog sender inputs.

**NOTE:** Customer to supply and install engine-mounted crank pilot relay, magnetic pickup and current transformers.

## OPTIONAL FEATURES

- **CIM** Communication Interface Module with internal 14.4Kbaud modem, RS232/422/485 ports and Modbus™ protocol c/w 6' communication cable.  
One CIM module provides communication interface for up to ten MEC 20 controllers with COM per system.\*
- **EAP 110** Remote annunciator with data communication link. 20 light annunciator for NFPA 110 (Level 1) & CSA282-00 faults\*
- **EXP** 16 point relay expansion module for individual fault output contacts on MEC 20. Specify number of expansion modules required (one module required for standard C282 or NFPA 110<sup>1</sup>, two modules required for standard and optional fault circuits). Relay contacts are configurable (normally open or closed) and are rated 0.5A 120VAC, 1.0A 30Vdc resistive (maximum)
- **MEC-O&M** Additional Product Manual (one manual is included with each unit shipped)
- **PRG** Custom programming of features (provides up to 6 custom fault labels)
- **VFD** Vacuum fluorescent display for extended low temperature operation (-40°C)

\* (Refer to separate literature for additional information)

<sup>1</sup> C282 or NFPA 110 standard faults exclude analog faults over/under voltage, over/under frequency, overcurrent, spare digital fault inputs #5 - #12 and programmable output #6

## PROGRAMMING

All of the following items are field programmable using the front panel keypad and LCD display.

A password code restricts access.

### General Programming

- Node address (1 - 255)
- System voltage (120 - 15000 volts)
- System frequency (50/60Hz)
- System phases (single or 3 phase)
- Voltage sensing ratio (1 - 208)
- Current sensing ratio (1 - 999)
- Engine temperature units (deg. F / C)
- Oil pressure units (PSI / KPA)
- Engine start delay (0 - 999 sec.)
- Crank time (0 - 99 sec.)
- Rest time (0 - 99 sec)
- Starter re-engage cycle time (0 - 99 sec.)
- Number of crank attempts (0 - 99)
- Oil bypass delay (0 - 99 sec)
- Cooldown time (0 - 99 min.)
- Number of flywheel teeth (0-999 teeth)
- Nominal engine speed (0-4000 RPM)
- Crank disconnect set point (0 - 100%)
- Over speed set point (100 - 150%)
- Run output fail safe activated (yes/no)
- Loss of speed signal (alarm/shutdown)
- Common fail output for "not in auto" (yes/no)
- Programmable output #1, 2, 3, 4, 5, 6<sup>1</sup>
- Post lube duration (0 - 999 min.)
- Cycle lube interval (1- 9999 min.)
- Cycle lube duration (0 - 999 min.)
- Horn duration (0 = continuous, 1- 999 sec)
- Display menu time-out (60 - 999 sec)

### Digital/Analog Fault Input Programming (For Each Circuit)

- Fault label description (choose from list)
- Level set point (analog fault)
- Shutdown or alarm
- Latched or non-latched alarm
- Always active or after bypass delay
- Transient delay (0 - 99 sec.)
- Fault contact open/close to fail (digital fault)

### Programmable Output Contact Functions

(select only one function per output used)

- Energize to stop
- Idle control
- Pre-lube/post-lube/cycle-lube control
- Switch not in auto alarm
- Over current
- Preheat
- Ready alarm status
- Engine run alarm status
- Air flap
- Transfer switch load test
- Oil bypass delay expired
- Common alarm
- Common fail
- Ready to load

### Analog Calibration Programming

- Analog zero
- Analog span

<sup>1</sup> Programmable outputs #5 & #6 are available only with option EXP

## SPECIFICATIONS

- **Power Supply:** 10 to 30Vdc, negative ground
- **Operating Temperature:** -15°C to +50°C
- **Environmental (Faceplate):** NEMA 12
- **Vibration:** 4g, 5-250Hz
- **Engine Gauge Display Accuracy:**
  - Analog Oil Pressure Measurement:**  
Range: 15 PSI – 150 PSI (maximum)  
Pressure Accuracy  
Operating range 15 - 59 PSI =  $\pm 6$  PSI  
Operating range 60 - 75 PSI =  $\pm 2$  PSI  
Operating range 76 - 150 PSI =  $\pm 7$  PSI
  - Analog Engine Temperature Measurement:**  
Range: 0-200°C (maximum)  
Temperature Accuracy  
Operating range 0 - 30°C =  $\pm 8$ °C  
Operating range 30 - 100°C =  $\pm 2$ °C  
Operating range 100 - 200°C =  $\pm 8$ °C
- **Power Consumption:** 5 watts (max.)
- **Storage Temperature:** -20°C to +70°C
- **Humidity:** 5 to 95% non-condensing
- **Dimensions:** 10.75"W x 6.75"H x 2.0"D
- **AC Metering Accuracy:**  $\pm 1.0\%$ , @ 25°C Volts, Amps  
 $\pm 2.0\%$ , @ 25°C KVA
- **Inputs:**
  - Engine Speed Sensing** 100 - 10,000Hz, 3.0 - 20VAC, rms
  - AC Voltage** 120 - 600VAC (nominal), 0.1VA, 3 phase, 50/60Hz
  - AC Current** 0 - 5Aac (nominal), 1.5VA, 3 phase
  - Engine Parameters** Dedicated Senders (supplied loose)
  - Digital Fault Contacts** Open or Close to DC Negative
- **Output Contacts:**
  - Run, Crank** 10A/240VAC, 8A/24Vdc resistive, (3A inductive, 0.4pf) Form A
  - Programmable, Common Fail** 10A/240VAC, 8A/24Vdc resistive, (3A inductive, 0.4pf) Form C