



A Subsidiary of Regal-Beloit Corporation

Paralleling Module

for use with SE Type Voltage Regulators

Part # A-527070

General Information

The Marathon Electric Paralleling Module is designed to be used with the Marathon SE Series Voltage Regulators. It is designed to be used in both of the standard paralleling schemes, Reactive Droop Compensation and Reactive Differential Compensation (Cross-Current). An externally connected unit/parallel mode switch (not by MEMC) will prevent unwanted voltage droop during single unit operation. In addition to equipping the voltage regulator for parallel operation, parallel operation of complete gen-sets requires that the engine governors be similarly equipped.

The Marathon Electric Paralleling Module operates with an externally connected current transformer. The Paralleling Module provides the droop signal necessary for two or more generators to share reactive loads, and to reduce circulating current between them.

Specifications

Current Transformer Requirements:

Secondary Rating	Secondary Current at rated Generator Load	Minimum CT Burden
5 Amps	3.5 Amps to 5.0 Amps	5VA

Generator Voltage Droop: 5% for 0.8 PF load

Operating Temperature: -55°C to +70°C (-67° F to +158° F)

Storage Temperature: -65°C to +85°C (-85° F to +185° F)

Weight: Approximately 1 pound (0.45 kg)

Mounting

The construction of the Marathon Electric Paralleling Module allows for mounting directly on the Engine or Generator Set, in the associated switchgear, or in the Generator Set Control Panel. The orientation of the mounting will not affect the operation of the Marathon Electric Paralleling Module. Mounting dimensions are given in Figure 1.

Interconnection and Operation

Typical connection between the Marathon Electric Paralleling Module and the SE Series Regulators are shown in Figure 2 and Figure 3. The line current is sensed by a 5 Amp secondary CT installed in the B-phase output. The CT should deliver between 3.5 to 5.0 Amps when the generator is at rated load and power factor.

Paralleling

It is recommended that the following test be performed to ensure correct polarity and phase relationships between the SE regulator, Paralleling Module, and CT. This test should be performed on all systems to be paralleled. If working with Reactive Differential Compensation, the interconnecting or "differential loop" should be left open until the tests are completed. Note that if the engine governors are configured for droop operation, then the voltage regulator underfrequency adjustment must be set sufficiently low to prevent the regulators from initiating underspeed reduced voltage operation when the gen-sets are at maximum kilowatt load.

- 1) Adjust R1 on the Paralleling Module fully CCW (maximum, resistance position).
- 2) Set Unit/Parallel switch to Unit or jumper the CT, or place a shorting jumper between C and 5A.
- 3) With generator operating at rated voltage and frequency, apply a lagging power factor load. Record generator voltage. Do not use Unity Power Factor Load.
- 4) With load still applied, set Unit/Parallel switch to Parallel. Record Voltage.
- 5) Verify the voltage in Parallel mode is less than voltage in Unit Mode.
- 6) If voltage is Higher in Parallel mode, shut down system and verify the CT and sensing leads are connected to the correct generator lines. If connections are good, interchange the CT secondary leads.
- 7) If step (6) was required, repeat steps (1) thru (4) to ensure the system voltage droop is obtained.

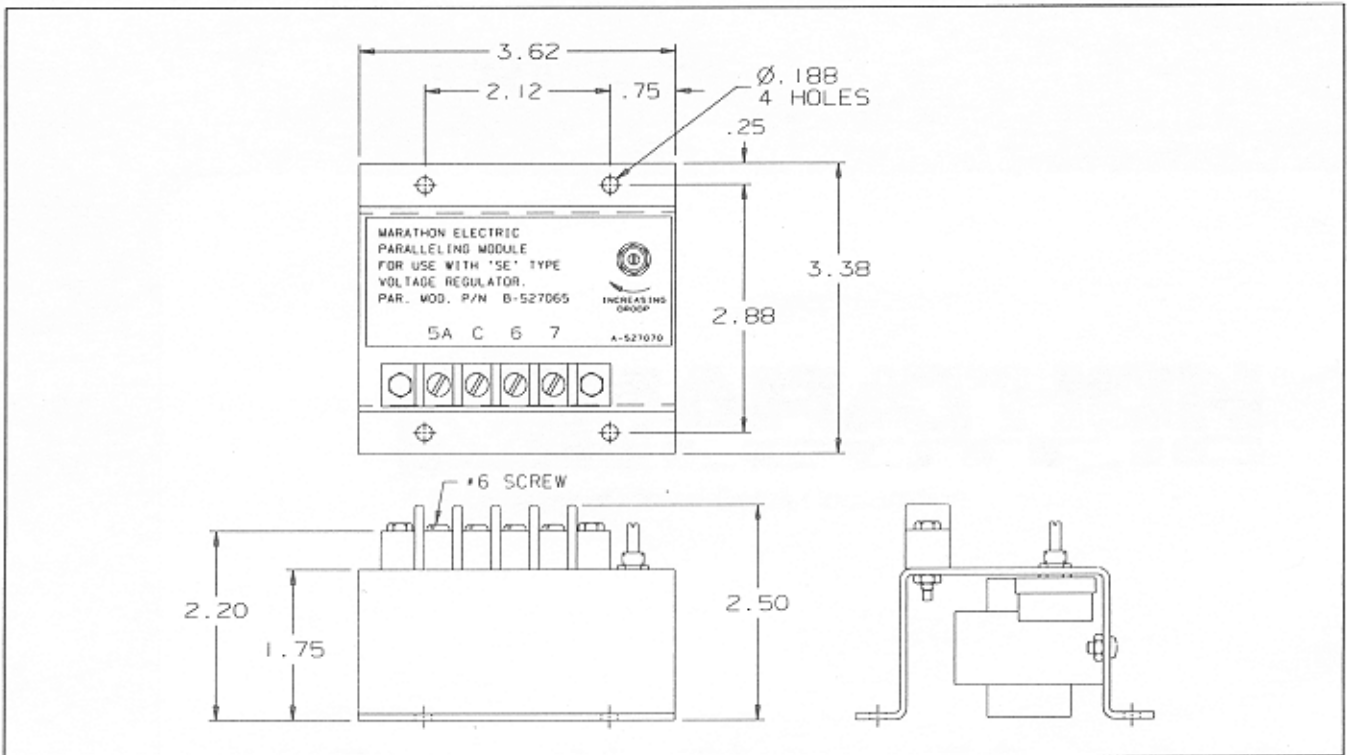


Figure 1 Paralleling Module

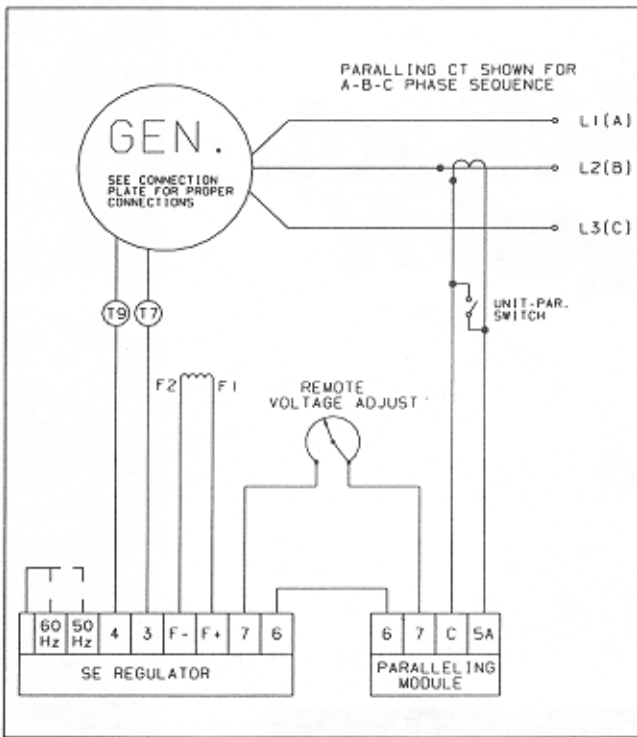


Figure 2 Droop Mode

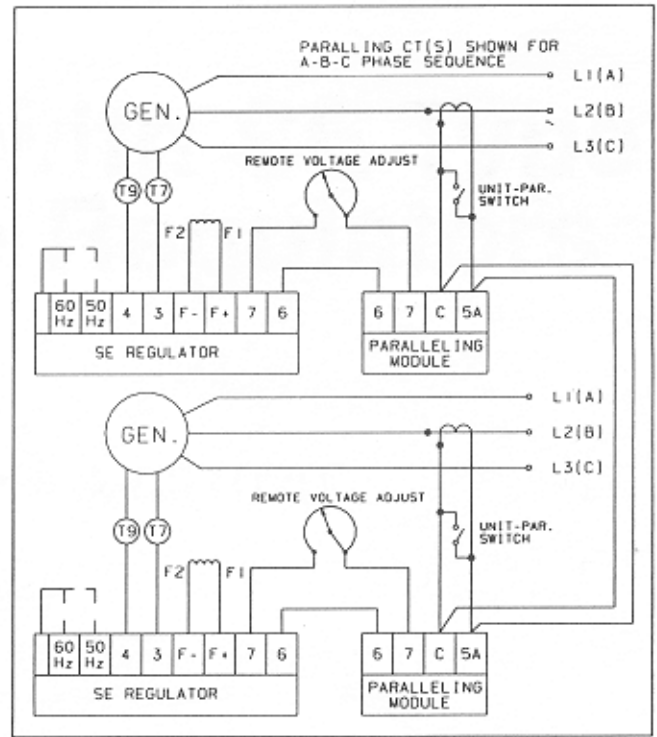


Figure 3 Reactive Differential Compensation Mode