



# SPM-D21 Series

## Synchronizer / Load Control

### APPLICATIONS

The SPM-D21 is a microprocessor-based synchronizer designed for use on three phase AC generators equipped with Woodward or other compatible speed controls and automatic voltage regulators. The SPM-D21 provides automatic frequency, phase and voltage matching using either analog or discrete output signals.

It combines synchronizing for a generator circuit breaker (GCB) and a mains circuit breaker (MCB), load and power factor control, and generator and mains protection.

### DESCRIPTION

#### Synchronizing

- Separately for GCB and MCB
- Phase match or slip frequency synchronization with voltage matching
- Two-phase sensing of generator, bus, and mains
- Selectable operating modes like SPM-A (Run, Check, Permissive, and OFF)
- Synchro-check possible
- Synchronization time monitoring

#### Mains parallel operation

- Real power control
- True RMS power calculation
- Generator real power setpoint by parameter (2 values) or via 0/4 to 20 mA
- Soft shutdown
- Power factor control
- Power factor setpoint by parameter

#### Isolated operation

- Frequency control
- Voltage control

#### Dead bus operation

- Closing of GCB or MCB on demand

### FURTHER SPM-D SYNCHRONIZERS

- The SPM-D10 Series provides two-phase generator and bus measurement refer to product specifications 37297 for more information
- The SPM-D10/YB Series provides three-phase generator and bus measurement refer to product specifications 37298 for more information
- The SPM-D11 Series provides load/var sharing refer to product specifications 37292 for more information

### DESCRIPTION

#### Protection

- Three-phase sensing of mains voltage
- Mains over-/undervoltage (59/27)
- Mains over-/underfrequency (810/U)
- Mains phase shift (78)
- Single-phase CT sensing for generator
- Two-phase sensing of generator voltage
- Generator over-/undervoltage (59/27)
- Generator over-/underfrequency (810/U)
- Generator reverse/reduced power (32R/F)
- Generator overload (32)

#### ANSI #

#### Control outputs

##### Standard

- Discrete raise/lower for speed/load
- Discrete raise/lower for voltage/power factor

##### PSVX Package

- Analog bias outputs for voltage and speed freely configurable for all levels (+/-1 V, +/-3 V, 0 to 5 V, 0.5 to 4.5 V, +/-10 V +/-5 V, 0 to 20 mA, +/-20 mA, and much more configurable)
- Speed bias output configurable as 500 Hz PWM output and adjustable voltage level
- Two raise/lower outputs configurable for either speed or voltage

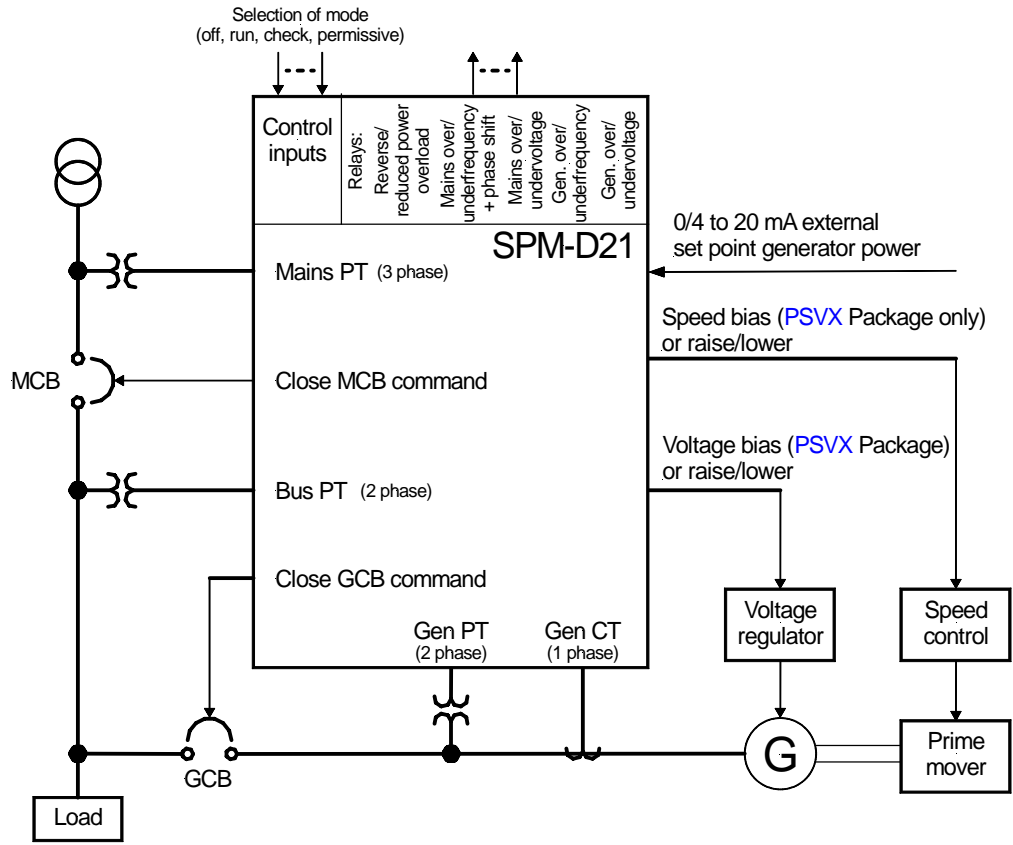
#### Operating Features

- Two-line Liquid Crystal display for operation and alarm indication
- Synchroscope
- Indication of control activity and breaker state
- Multi-level password protection for parameters
- Configuration directly or via PC
- English or German language adjustable

- Generator and mains protection
- Synchronization for one or two circuit breakers
- Frequency, phase, and voltage matching
- Selectable types of control output
- Digital display of generator, bus, and mains values
- Real power control
- Power factor control
- PC and front panel configurable
- Microprocessor technology for flexible and reliable operation
- CE marked
- UL/cUL Listed

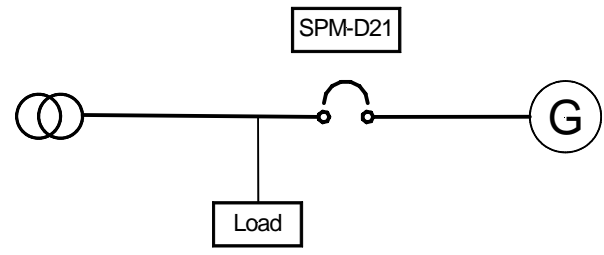
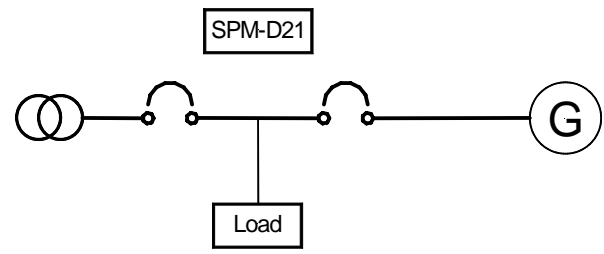


# APPLICATION DIAGRAM



# APPLICATION DIAGRAM

- synchronizer for generator and/or mains



# FEATURES OVERVIEW

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Subject to technical modifications.

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37293A - 06/3/S

SPM-D Series Two Breaker Synchronizer / Load Control	SPM-D21/PSV	SPM-D21/PSVX
<b>Measuring/Display</b>		
Generator voltage, 2phase	✓	✓
Generator current, 1phase	✓	✓
Busbar voltage, 2phase	✓	✓
Mains voltage, 3phase	✓	✓
<b>Control</b>		
Breaker	2	2
Synchronization, 2phase	✓	✓
Isolated operation	✓	✓
Mains parallel operation	✓	✓
SPM-A synchronization modes	✓	✓
Dead bus operation	✓	✓
<b>Protection</b>		
	<b>ANSI #</b>	
Generator: over-/undervoltage	(59/27)	✓
Generator: over-/underfrequency	(81O/U)	✓
Generator: overload	(32)	✓
Generator: reverse power	(32R)	✓
Generator: reduced power	(32F)	✓
Mains: over-/undervoltage	(59/27)	✓
Mains: over-/underfrequency	(81O/U)	✓
Mains: phase shift	(78)	✓
Alarm relays	5	5
<b>Controller</b>		
Discrete raise/lower: speed & load	✓	✓ #1
Discrete raise/lower: voltage & power factor	✓	✓ #1
Analog output: speed & load		✓
Analog output: voltage & power factor		✓
PMW output: speed & load		✓
Active power setpoint: 0/4 to 20 mA	✓	✓
<b>Listings/Approvals</b>		
CE marked	✓	✓
UL/cUL listed	✓	✓
<b>Accessories</b>		
Configuration via PC #2	✓	✓
<b>Manuals (for other languages please refer to the Woodward homepage)</b>		
	English	37249
	German	GR37249
<b>Part numbers P/N</b>		
	Measuring inputs 100 Vac, ..1 A	8440-1022
	Measuring inputs 100 Vac, ..15 A	8440-1023
	Measuring inputs 400 Vac, ..15 A #3	8440-1025

#1 Configurable to either speed/load or voltage/power factor

#2 Cable incl. software necessary (DPC)

#3 All units with 400V measuring inputs can also be used for 100V system voltage