



# SPM-D10 Series

## One Breaker Synchronizer

### APPLICATIONS

The SPM-D10 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-D10 synchronizer provides automatic frequency, phase and voltage matching using either analog- or discrete output bias signals.

The **HJV** Package provides additional mains protection.

Part-No. 8440-1668 SPM-D1040B/**XN** is a direct replacement of the SPM-A synchronizer.

### DESCRIPTION

#### Synchronizing

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

#### Isolated operation

- Frequency control
- Voltage control

#### Dead bus operation

- Closing of CB on demand

### FURTHER SPM-D SYNCHRONIZERS

- 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
- The SPM-D21 Series provides synchronizing for two circuit breakers and load control refer to product specifications 37293 for more information

### DESCRIPTION

#### Protection

##### HJV Packages

- Three-phase sensing of mains voltage
- Mains over-/undervoltage (59/27)
- Mains over-/underfrequency (810/U)
- Mains phase/vector shift (78)

#### ANSI #

#### Control outputs

##### Standard

- Discrete raise/lower for speed
  - Discrete raise/lower for voltage
- ##### X & XN Packages
- 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 with 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

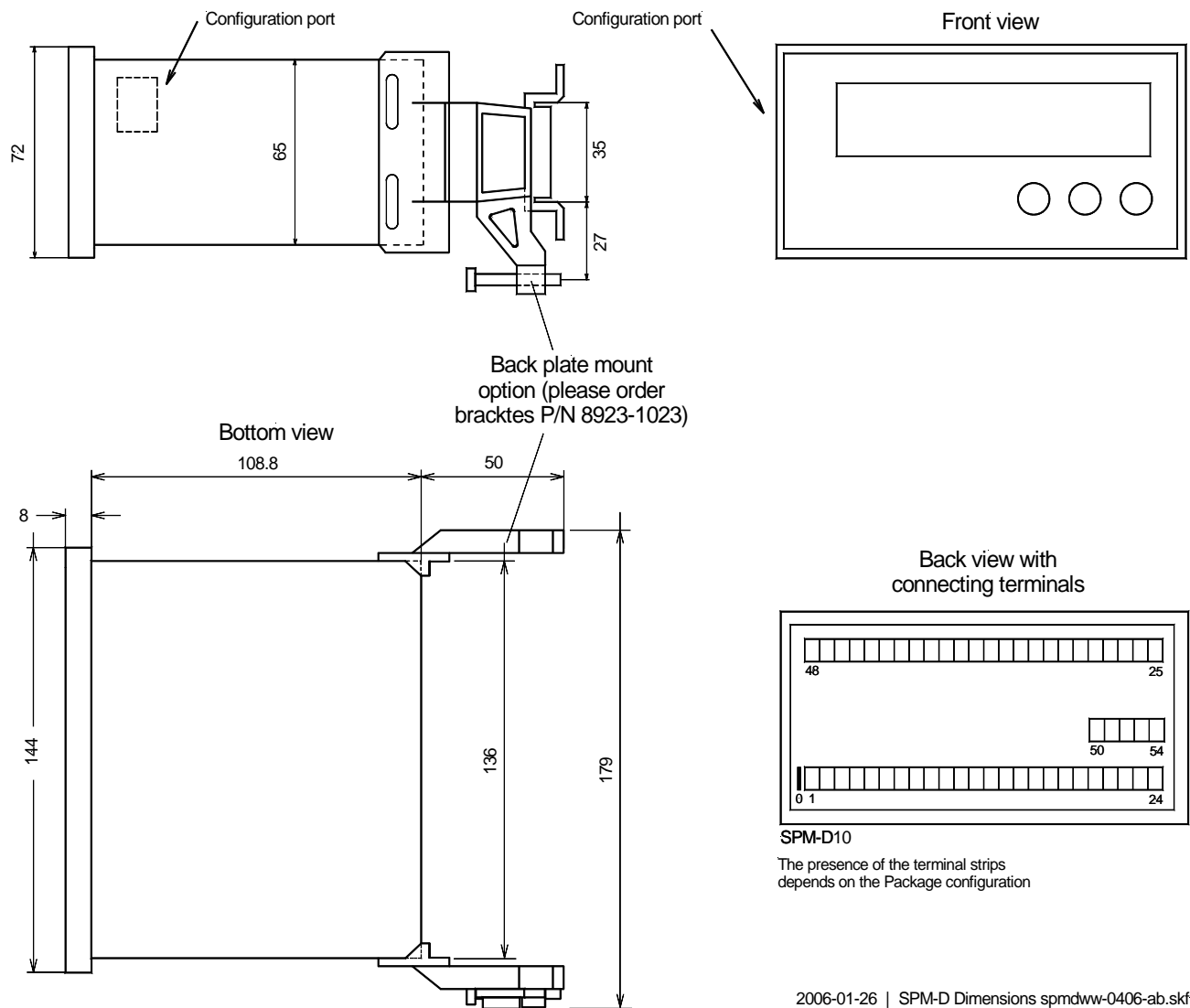
- Synchronization for one circuit breaker
- Frequency, phase, and voltage matching
- Selectable types of control output
- Digital display of generator and bus values
- Microprocessor technology for flexible and reliable operation
- Wide range power supply available
- Additional mains protection and display of mains values available
- PC and front panel configurable
- CE marked
- UL/cUL Listed

# SPECIFICATIONS (for more see specific manuals)

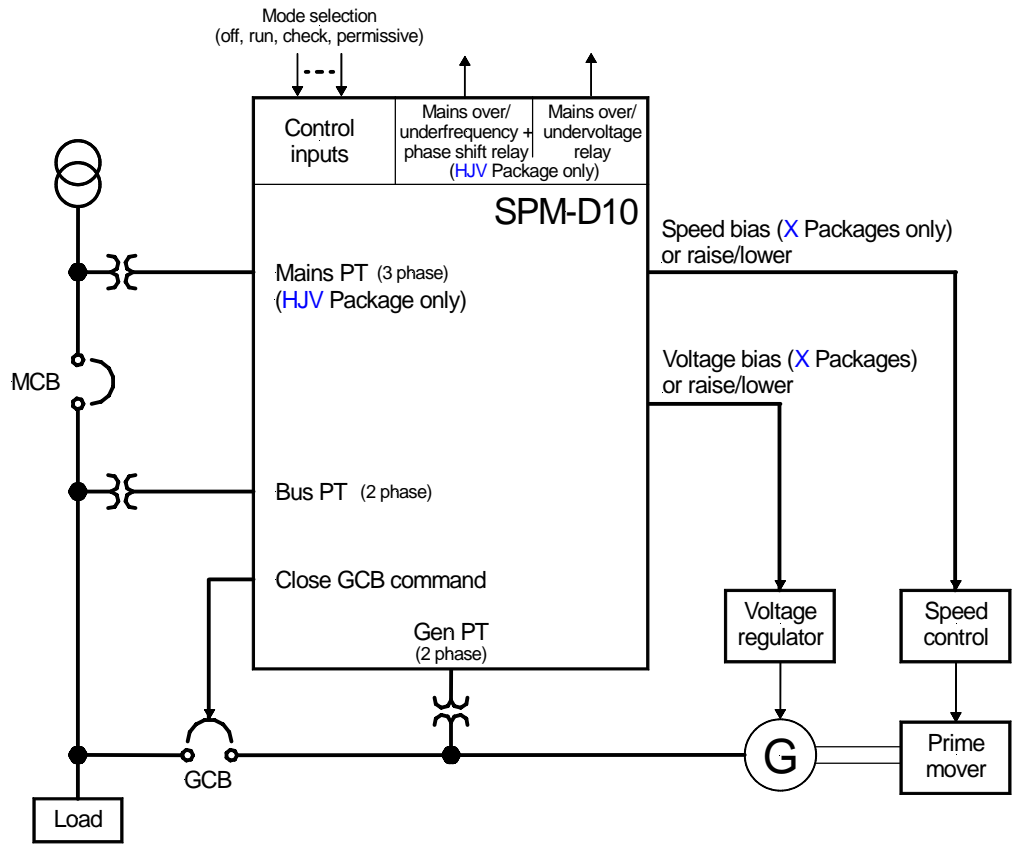
Accuracy ..... Class 1  
 Power supply ..... [Standard] 24 Vdc (+/-25 %) [N & XN Packages] 90 to 250 Vac/dc  
 Intrinsic consumption ..... max. 10 W  
 Ambient temperature ..... -20 to 70 °C [N & XN Packages] -20 to 60 °C  
 Ambient humidity ..... 95 %, non-condensing  
**Voltage** ..... Rated  $\lambda/\Delta$ : [1] 66/115 Vac or [4] 230/400 Vac  
 Maximum value ( $V_{max}$ ): [1] 150 Vac or [4] 300 Vac  
 Rated voltage  $V_{ph-ground}$ : [1] 150 Vac or [4] 300 Vac  
 Rated surge voltage: [1] 2.5 kV or [4] 4.0 kV  
 Measuring frequency ..... 40 to 70 Hz  
 Linear measuring range up to .....  $1.3 \times V_{rated}$   
 Input resistance ..... [1] 0.21 M $\Omega$ , [4] 0.696 M $\Omega$   
 Max. power consumption per path ..... < 0.15 W  
**Discrete inputs** ..... isolated  
 Input range ..... max. 250 Vac or dc  
 Input resistance ..... approx. 68 k $\Omega$

**Relay outputs** ..... isolated  
 Contact material ..... AgCdO  
 Load (GP) ..... 2.00 Aac@250 Vac  
 2.00 Adc@24 Vdc / 0.36 Adc@125 Vdc / 0.18 Adc@250 Vdc  
 Pilot duty (PD) ..... 1.00 Aac@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc  
**Housing** ..... Type APRANORM DIN 43 700  
 Dimensions ..... 144x72x122 mm  
 Front cutout ..... 138[+1.0]x67[+0.7] mm  
 Connection ..... screw/plug terminals depending on connector 1.5 mm<sup>2</sup> or 2.5 mm<sup>2</sup>  
 Front ..... insulating surface  
**Protection system** ..... with correct installation  
 Front ..... IP42 (sealed IP54; gasket kit = P/N 8923-1037)  
 Back ..... IP21  
 Weight ..... approx. 800 g  
**Disturbance test (CE)** ..... tested according to applicable EN guidelines  
**Listings** ..... UL/cUL listed (voltages up to 300 Vac)

# DIMENSIONS

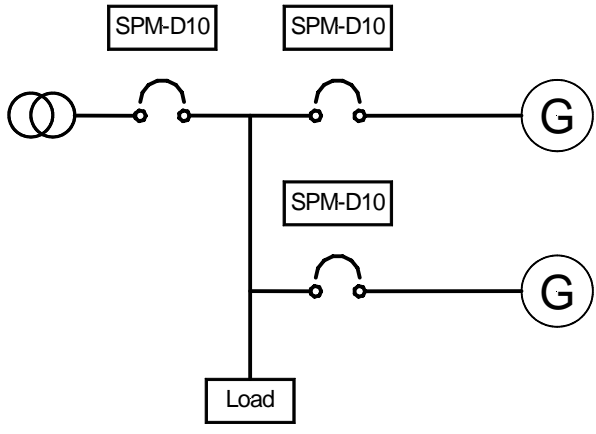


# APPLICATION DIAGRAM

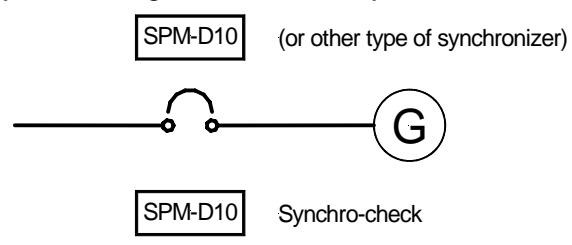


# APPLICATION EXAMPLES

- generator synchronizer or mains synchronizer



- synchronizing with additional synchro-check



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37297B - 06/3/S

## FEATURES OVERVIEW

SPM-D10 Series Synchronizer #1	SPM-D10	SPM-D10X	SPM-D10N	SPM-D10XX	SPM-D10HJV	
<b>Measuring/Display</b>						
Generator voltage, 2phase	✓	✓	✓	✓	✓	
Busbar voltage, 2phase	✓	✓	✓	✓	✓	
Mains voltage, 3phase					✓	
<b>Control</b>						
Breaker	1	1	1	1	1	
Synchronization, 2phase	✓	✓	✓	✓	✓	
Isolated operation	✓	✓	✓	✓	✓	
<b>Protection</b>						
Mains: over-/undervoltage					✓	
Mains: over-/underfrequency					✓	
Mains: dq/dt (phase/vector jump)					✓	
Alarm relays					2	
<b>Controller</b>						
Discrete raise/lower: speed	✓	✓ #2	✓	✓ #2	✓	
Discrete raise/lower: voltage	✓	✓ #2	✓	✓ #2	✓	
Analog output: speed		✓		✓		
Analog output: voltage		✓		✓		
PMW output: speed		✓		✓		
<b>Listings/Approvals</b>						
CE marked	✓	✓	✓	✓	✓	
UL/cUL listed	✓	✓	✓	✓	✓	
<b>Accessories</b>						
Configuration via PC #3	✓	✓	✓	✓	✓	
<b>Power supply</b>						
24 Vdc	✓	✓			✓	
Wide range 90 to 250 Vac/dc			✓	✓		
	English	37215	37215	37215	37215	37215
	German	GR37215	GR37215	GR37215	GR37215	GR37215
<b>Part numbers P/N</b>						
Measuring inputs 100 Vac	5448-890	5448-893	8440-1432	8440-1667		
Measuring inputs 400 Vac #4	8440-1019	8440-1301	8440-1433	8440-1668	8440-1458	

#1 Information about the SPM-D10YB can be found in the separate product specs 37298  
 #2 Configurable to either speed or voltage  
 #3 Cable incl. software necessary (DPC)  
 #4 All units with 400V measuring inputs can also be used for 100V system voltage