



# SPM-D11 Series

## Load Share Synchronizer

### APPLICATIONS

The SPM-D11 is a microprocessor-based synchronizer designed for use on one or three-phase AC generators equipped with Woodward or other compatible speed controls and automatic voltage regulators. The SPM-D11 synchronizer provides automatic frequency, phase and voltage matching using either analog- or discrete output bias signals.

It combines synchronizing for one circuit breaker, load and power factor control or isochronous load sharing and generator protection.

### 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
- Load/var sharing

#### 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 unloading
- Power factor control
- Power factor setpoint by parameter
- Power limit value with relay output

#### Isolated operation

- Frequency control
- Voltage control

#### Dead bus operation

- Closing of breaker 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

### DESCRIPTION

#### Protection

- Single-phase CT sensing for generator
- Two-phase sensing of generator voltage
- Generator over-/undervoltage (59/27)
- Generator over-/underfrequency (81O/U)
- Generator reverse/reduced power (32R/F)
- Generator overload (32)

#### ANSI #

#### Control outputs

##### LSXR 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

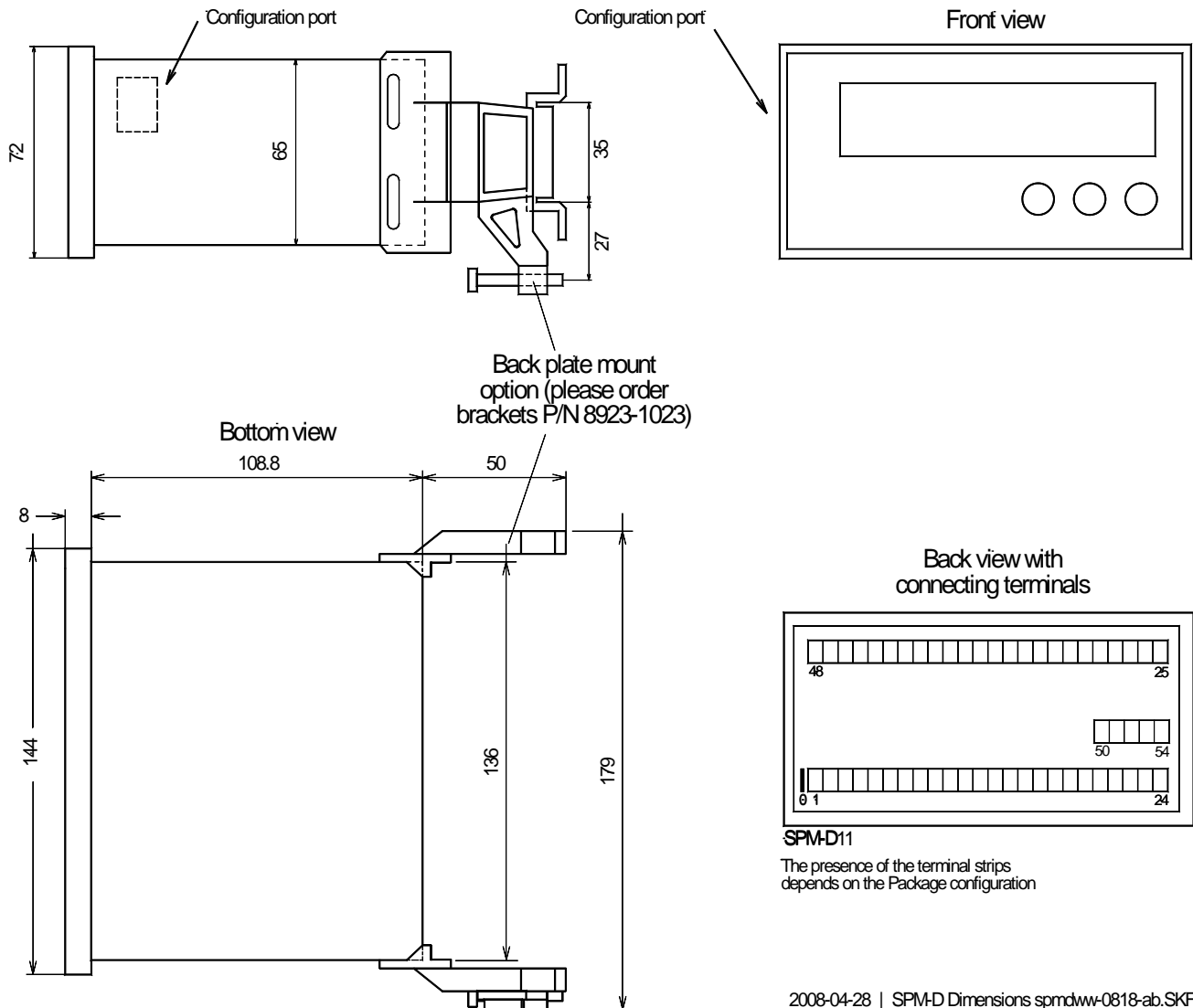
- Load/var sharing
- Generator protection
- Synchronization for one circuit breaker
- Frequency, phase, and voltage matching
- Selectable types of control output
- Digital display of generator and bus values
- Real power control
- Power factor control
- PC and front panel configurable
- Microprocessor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

# SPECIFICATIONS (for more see specific manuals)

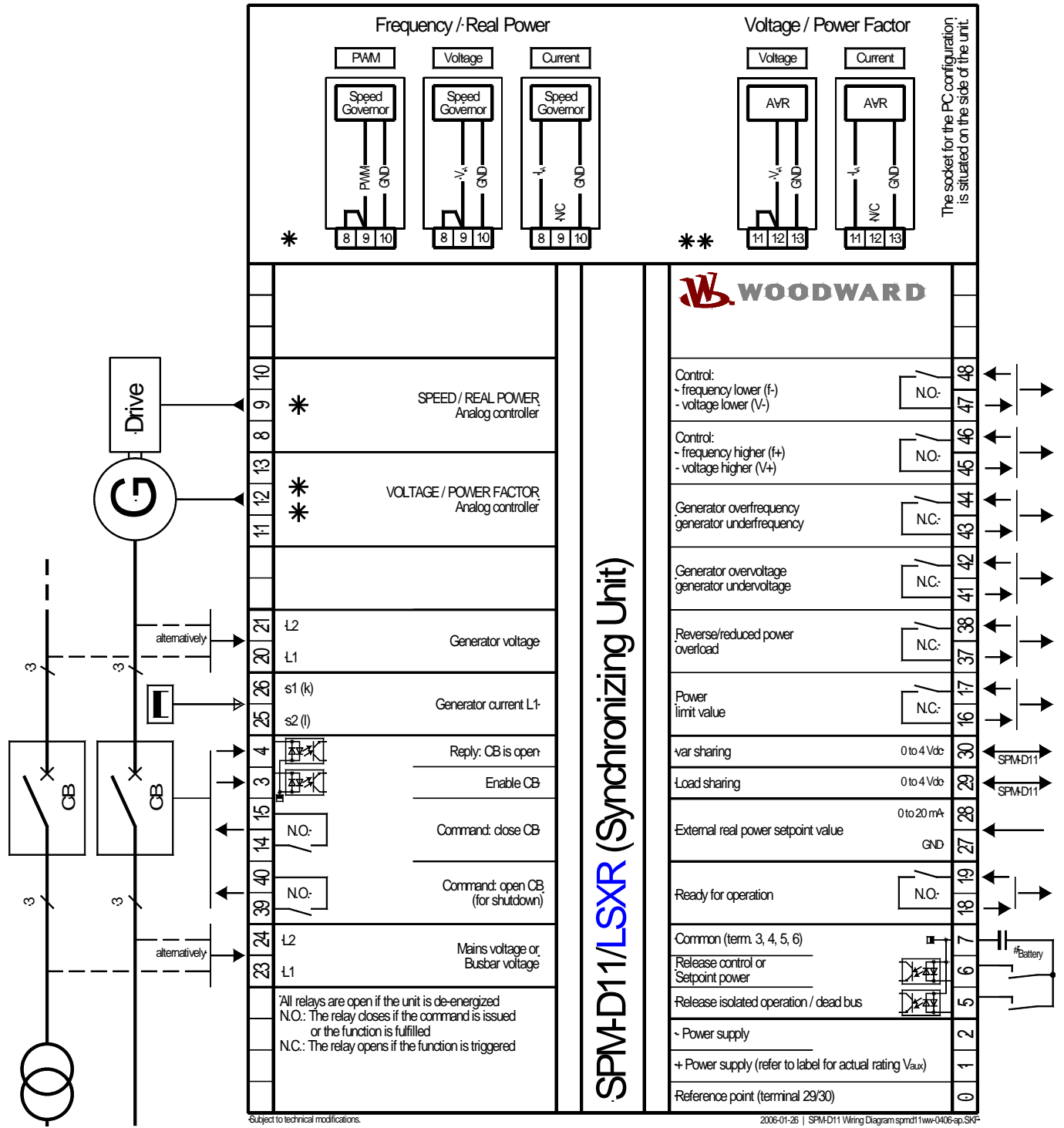
Accuracy .....	Class 1
Power supply .....	12/24 Vdc (9.5 to 32 Vdc)
Intrinsic consumption .....	max. 10 W
Ambient temperature .....	-20 to 70 °C
Ambient humidity .....	95 %, non-condensing
<b>Voltage</b> .....	Rated $\sqrt{D}$ : [1] 66/115 Vac or [4] 230/400 Vac
	Maximum value ( $V_{max}$ ): [1] 150 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 MW, [4] 0.696 MW
Max. power consumption per path .....	< 0.15 W
<b>Current</b> ( $I_{rated}$ ) .....	[1] ..1 A, [5] ..15 A
Linear measuring range up to .....	$3.0 \times I_{rated}$
Load .....	< 0.15 VA
Rated short-time current (1 s) .....	[1] $50 \times I_{rated}$ , [5] $10 \times I_{rated}$
<b>Discrete inputs</b> .....	isolated
Input range .....	12/24Vdc or 18 to 250 Vac/dc
Input resistance .....	approx. 6.8 kW or 68 kW

<b>Relay outputs</b> .....	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 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc
<b>Housing</b> .....	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
<b>Protection system</b> .....	with correct installation
	Front .....
	IP42
	(sealed IP54; gasket kit = P/N 8923-1037)
	Back .....
	IP21
Weight .....	depending on version, approx. 800 g
<b>CE approval</b> .....	tested according to applicable EN guidelines
<b>Listings</b> .....	UL/cUL listed (voltages up to 300 Vac)

# DIMENSIONS



# WIRING DIAGRAM



Subject to technical modifications.

**International**  
 Woodward  
 PO Box 1519  
 Fort Collins CO, USA  
 80522-1519  
 1000 East Drake Road  
 Fort Collins CO 80525  
 Ph: +1 (970) 498-3634  
 Fax: +1 (970) 498-3058  
 email:  
 SalesPGD\_NAandCA@woodward.com

**Europe**  
 Woodward GmbH  
 Handwerkstrasse 29  
 70565 Stuttgart, Germany  
 Ph: +49 (0) 711 789 54-510  
 Fax: +49 (0) 711 789 54-101  
 email:  
 SalesPGD\_EMEA@woodward.com

**Distributors & Service**  
 Woodward has an international network of distributors and service facilities. For your nearest representative, call the Fort Collins plant or see the Worldwide Directory on our website.

[www.woodward.com](http://www.woodward.com)

For more information contact:

Subject to technical modifications.

This document is distributed for informational purposes only. It is not to be construed as creating or becoming part of any Woodward Governor Company contractual or warranty obligation unless expressly stated in a written sales contract.

We appreciate your comments about the content of our publications. Please send comments including the document number below to  
 stgt-doc@woodward.com

© Woodward

**All Rights Reserved**

37292D - 2012/6/Stuttgart

## FEATURES OVERVIEW

SPM-D Series Synchronizer		SPM-D11/LSXR 12/24 Vdc
<b>Measuring/Display</b>		
Generator voltage, 2phase		Ü
Generator current, 1phase		Ü
Busbar voltage, 2phase		Ü
<b>Control</b>		
Breaker		1
Synchronization, 2phase		Ü
Isolated operation		Ü
Mains parallel operation #1		Ü
SPM-A synchronization modes		Ü
Dead bus operation		Ü
<b>Protection</b>		
Generator: over-/undervoltage	(59/27)	Ü
Generator: over-/underfrequency	(81O/U)	Ü
Generator: overload	(32)	Ü
Generator: reverse power	(32R)	Ü
Generator: reduced power	(32F)	Ü
<b>Controller</b>		
Discrete raise/lower: speed/load		Ü#2
Discrete raise/lower: voltage/power factor		Ü#2
Analog output: speed & load		Ü
Analog output: voltage & power factor		Ü
PMW output: speed & load		Ü
Active power setpoint: 0/4 to 20 mA		Ü
Load/var sharing		Ü
<b>I/O's</b>		
Alarm relays		3
Signalling relays		3
<b>Listings/Approvals</b>		
CE marked		Ü
UL/cUL listed		Ü
<b>Accessories</b>		
Configuration via PC #3		Ü
<b>Manuals (for other languages please refer to the Woodward homepage)</b>		
	English	37259
	German	GR37259
<b>Voltage ratings</b>		
Power supply		12/24 Vdc
Discrete inputs		12/24 Vdc
<b>Part numbers P/N</b>		
	Measuring inputs 100 Vac, ..1 A	8440-1705
	Measuring inputs 100 Vac, ..1/5 A	8440-1706
	Measuring inputs 400 Vac, ..1/5 A #4	8440-1666

#1 Additional mains decoupling relay like MFR11 required

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

#3 Configuration software "LeoPC" available free at Woodward.com, RS232 connection requires Woodward DPC cable P/N 5417-557

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