



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

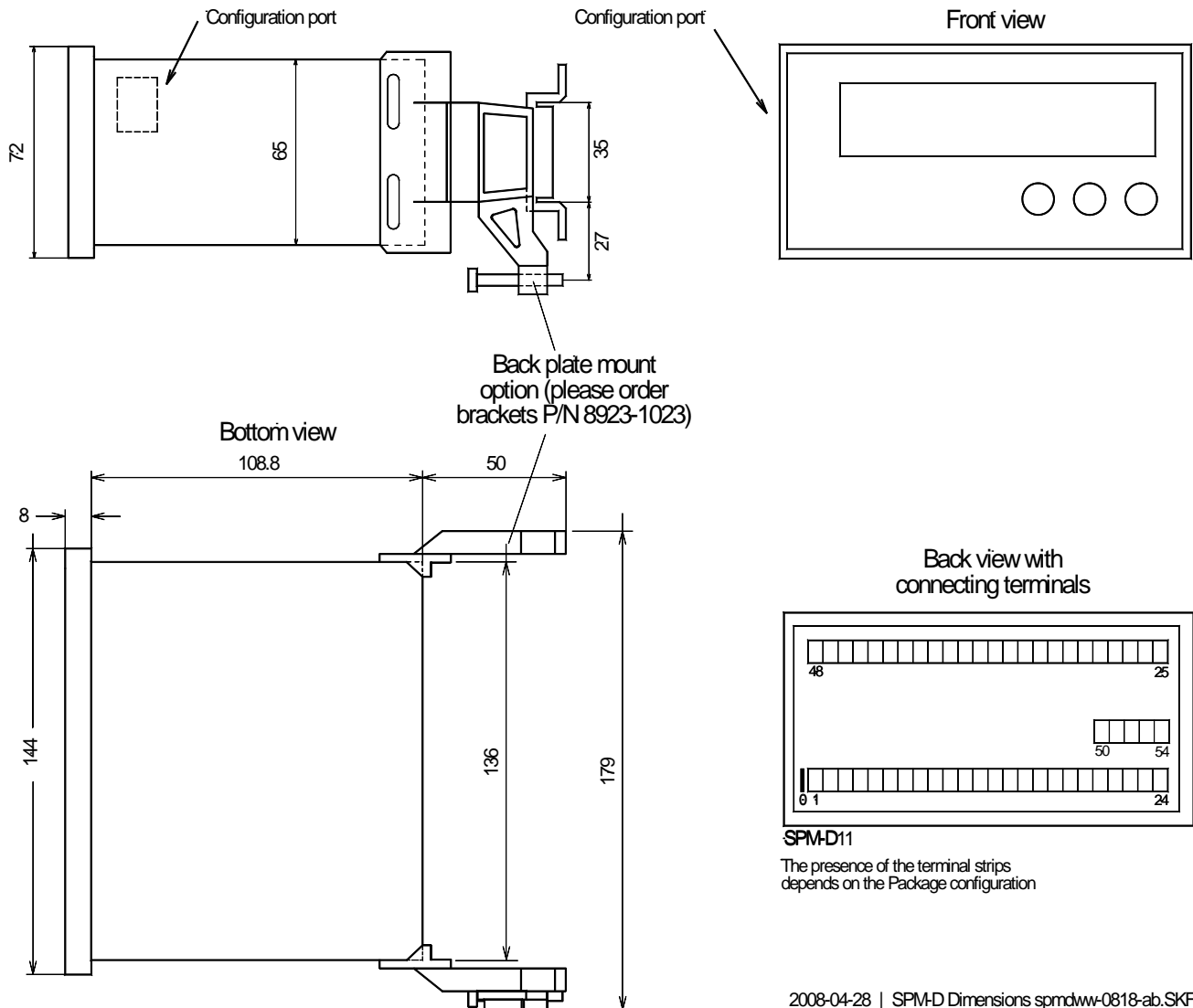
- Load/var sharing
- Generator protection
- Synchronization for one circuit breaker
- Frequency, phase, and voltage matching
- Selectable types of control output
- Digital display of generator and bus values
- Real power control
- Power factor control
- PC and front panel configurable
- Microprocessor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

SPECIFICATIONS (for more see specific manuals)

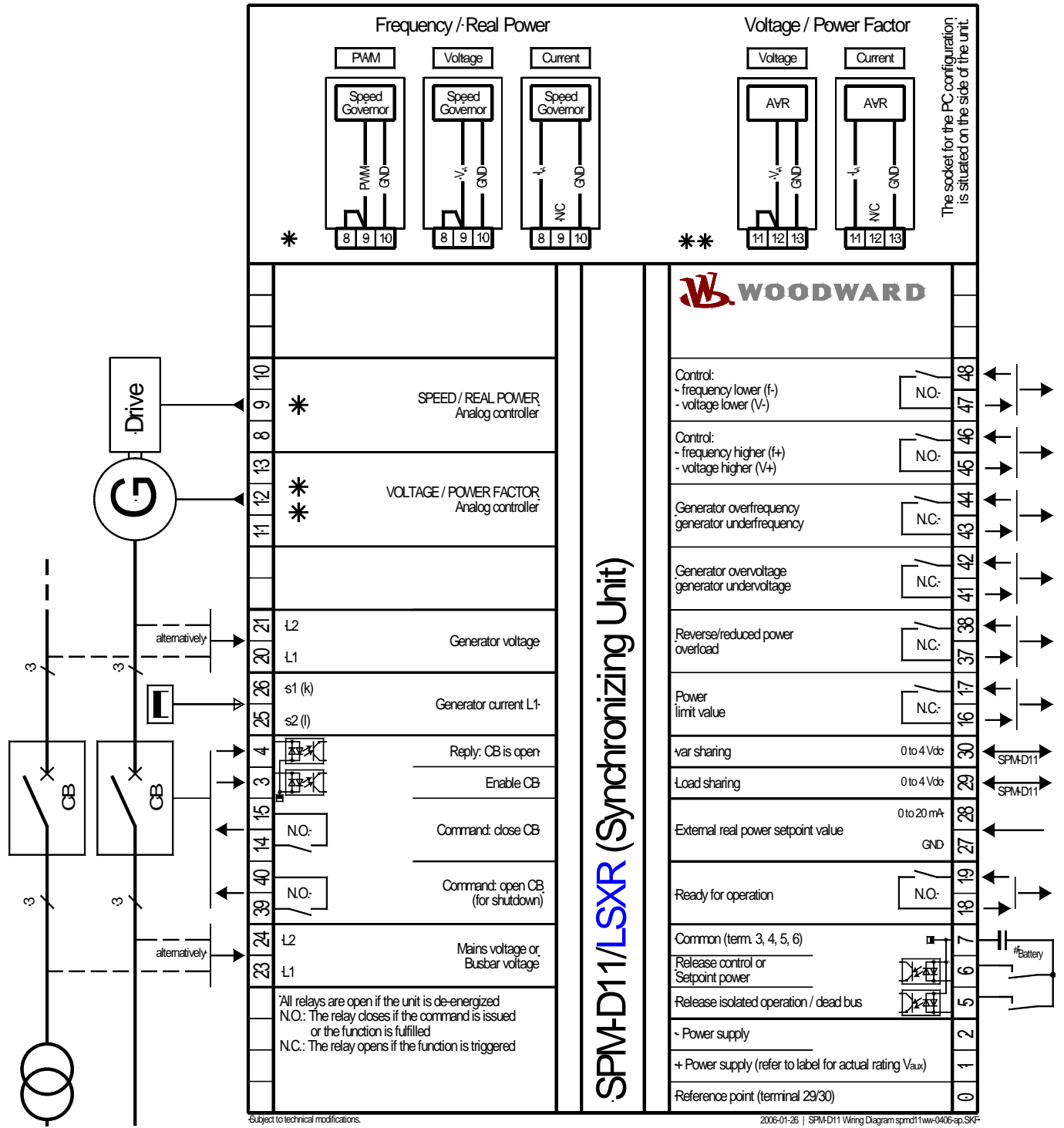
Accuracy	Class 1
Power supply	12/24 Vdc (9.5 to 32 Vdc)
Intrinsic consumption	max. 10 W
Ambient temperature	-20 to 70 °C
Ambient humidity	95 %, non-condensing
Voltage	Rated \sqrt{D} : [1] 66/115 Vac or [4] 230/400 Vac
	Maximum value (V_{max}): [1] 150 Vac or [4] 300 Vac
	Rated voltage $V_{ph-ground}$: [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
Current (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] $10 \times I_{rated}$
Discrete inputs	isolated
Input range	12/24Vdc or 18 to 250 Vac/dc
Input resistance	approx. 6.8 kW or 68 kW

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 Adc@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 ² or 2.5 mm ²
Front	insulating surface
Protection system	with correct installation
	Front
	IP42
	(sealed IP54; gasket kit = P/N 8923-1037)
	Back
	IP21
Weight	depending on version, approx. 800 g
CE approval	tested according to applicable EN guidelines
Listings	UL/cUL listed (voltages up to 300 Vac)

DIMENSIONS



WIRING DIAGRAM



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FEATURES OVERVIEW

SPM-D Series Synchronizer		SPM-D11/LSXR 12/24 Vdc
Measuring/Display		
Generator voltage, 2phase		Ü
Generator current, 1phase		Ü
Busbar voltage, 2phase		Ü
Control		
Breaker		1
Synchronization, 2phase		Ü
Isolated operation		Ü
Mains parallel operation #1		Ü
SPM-A synchronization modes		Ü
Dead bus operation		Ü
Protection		
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
Controller		
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
I/O's		
Alarm relays		3
Signalling relays		3
Listings/Approvals		
CE marked		Ü
UL/cUL listed		Ü
Accessories		
Configuration via PC #3		Ü
Manuals (for other languages please refer to the Woodward homepage)		
	English	37259
	German	GR37259
Voltage ratings		
Power supply		12/24 Vdc
Discrete inputs		12/24 Vdc
Part numbers P/N		
	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