



New Features

- ✓ USB connectivity to PC
- ✓ ToolKit configuration support
- ✓ Password protection to all variants
- ✓ Same look & feel as SPM-D
- ✓ Drop-In replacement

Load Share Synchronizers for 3-ph AC Gen-Sets

DESCRIPTION

Woodward understands the time-intensive nature of Power Generation projects. Ensuring the longevity of components is one way we can make our customers successful. Woodward has supplied and supported the well-established SPM-D line of synchronizers for 20+ years. With the state of the art Drop-In replacement successor, SPM-D2 the life of this synchronizer line is now extended. All of the SPM-D2 synchronizers are password protected and are configurable either through HMI as before or through ToolKit configuration tool with USB connectivity.

The SPM-D2-11 is a microprocessor-based synchronizers designed for use on two or three phase AC generators equipped with Woodward or other compatible speed controls and automatic voltage regulators. The SPM-D2-11 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. This synchronizer is applied to a wide range of prime movers and generators, as its control signals may be set to fit several types of gensets - from fast reacting diesel engines to soft reacting gas turbines.

The SPM-D2-11 synchronizer is available in 1 base model:

- **SPM-D2-11 .../LSXR:** provides 1-phase / 2-wire voltage measurement with analog or discrete biasing signals, analog active and reactive load sharing lines, and generator protection.

FEATURES

- Phase match or slip frequency synchronization with voltage matching
- Two-phase true RMS voltage sensing of generator and bus with Class I accuracy
- Selectable operating modes like SPM-A (Run, Check, Permissive, and Off)
- Synch-Check and synchronization time monitoring
- Dead bus closing of CB on demand
- Two analog load share lines for Load/var sharing
- Active power and power factor control in mains parallel operation
- Voltage and frequency control in isolated operation
- Generator real power setpoint by parameter (2 values) or via 0/4 to 20 mA analog input
- Soft unloading and power limit value with relay output
- Control outputs: Discrete raise/lower for speed and voltage in all variants, or analog signals (Voltage, Current and PWM)
- Single phase CT sensing for generator with power, overload, voltage and frequency protection
- Two line bright liquid crystal display for operation, alarm, measuring values visualization and parameterization
- Front face with synchronoscope and indication of breaker state/control activity
- Multi-level password protection of parameters
- Woodward ToolKit™ software for configuration via USB
- Two built-in languages: English, German

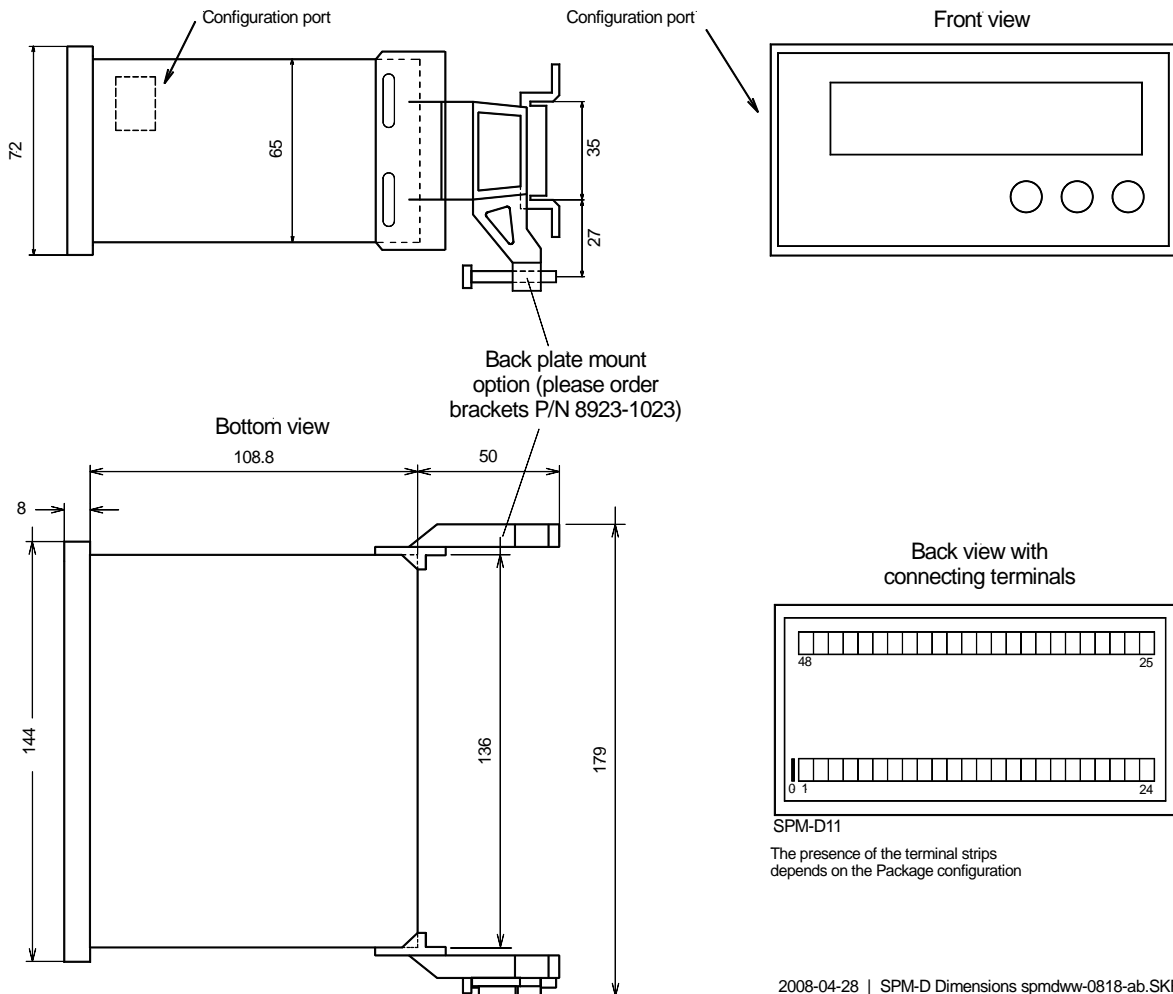
- Synchronization for one circuit breaker
- Active Power (kW) / Reactive Power (VAR) sharing (Analog)
- Generator Protection
- Active power and power factor control
- Frequency, Phase and Voltage Matching
- Compatible with a wide range of GOVs and AVR's
- Analog input to control active power set-point externally
- Circuit breaker time compensation
- Two lines bright LCD display for generator and bus values
- Front face synchronoscope for easy commissioning
- Configurable through HMI or PC
- CE Marked (RoHS2 compliant)
- UL/cUL Listed

SPECIFICATIONS (See specific manuals for more details)

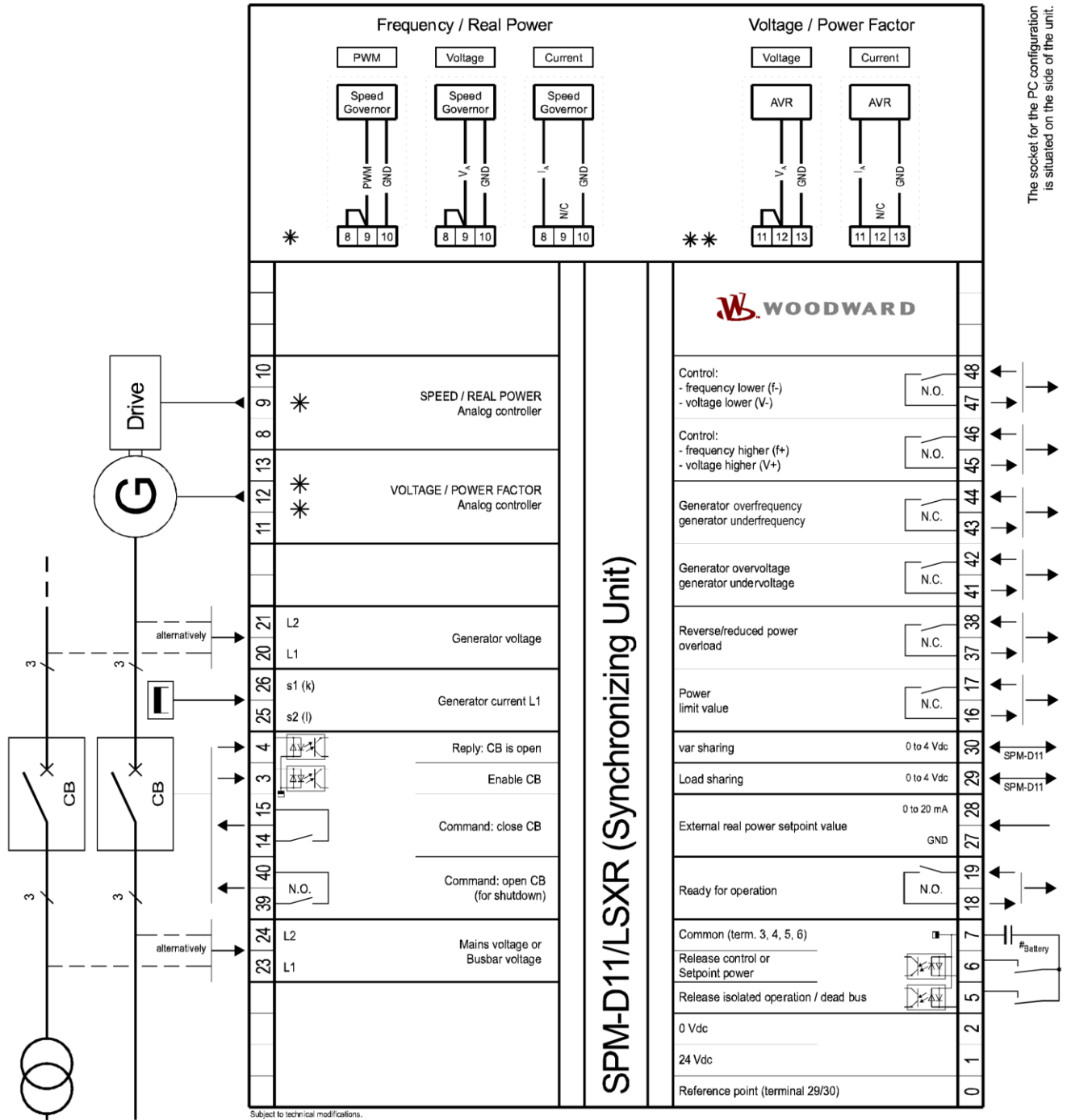
Power supply	12/24 V _{DC} (9.5 to 32 V _{DC})
Intrinsic consumption	max. 8 W
Ambient temperature (operation)	-20 to 70 °C
Ambient humidity	95%, non-condensing
Voltage	(λ/Δ)
[1] 100 Vac	Rated (V _{rated})..... 63/110 V _{AC}
	Max. value (V _{max})..... 150 V _{AC}
and [4] 400 Vac	Rated (V _{rated})..... 230/400 V _{AC}
	Max. value (V _{max})..... 300 V _{AC}
	Rated surge volt. (V _{surge})..... [1] 2.5 kV, [4] 4.0 kV
Accuracy	Class 1
Measuring frequency	50/60 Hz (40 to 70 Hz)
Linear measuring range	1.25 x V _{rated}
Input resistance	[1]0.21 MOhms, [4]0.696 MOhms
Current	Rated (I _{rated}) [1].../1 A, [5] ... /5 A
Linear measuring range	3.0 x I _{rated}
Burden	< 0.15 VA
Rated short-time overcurrent (1 s)	[1] 50 x I _{rated} , [5] 10 x I _{rated}
Discrete inputs	isolated
Input range	12/24 V _{DC}
Input resistance	approx. 6.8 kOhms
Analog inputs	freely scalable
Resolution	10 Bit
0/4 mA to 20 mA input	250 Ohms

Relay outputs	isolated
Contact material	AgCdO
Load (GP) (V _{cont, relay output}) AC:	2.00 A _{AC} @250 V _{AC}
DC:	2.00 A _{DC} @24 V _{DC} / 0.36 A _{DC} @125 V _{DC} / 0.18 A _{DC} @250 V _{DC}
Pilot Duty (PD) AC:	B300
DC:	1.00 A _{DC} @24 V _{DC} / 0.22 A _{DC} @125 V _{DC} / 0.10 A _{DC} @250 V _{DC}
Analog Outputs (isolated)	freely scalable
Type	± 10 V / ± 20 mA / PWM
Insulation voltage (continuously, AVR out)	300 V _{AC}
Insulation voltage (continuously, Gov out)	100 V _{AC}
Resolution	12 Bit
± 10 V (scalable)	internal resistance
± 20 mA (scalable)	maximum load 500 Ohms
Housing	Front panel flush mounting..... Type APRANORM DIN 43 700
Dimensions	WxHxD..... 142 x 72 x 122 mm
Front cutout	WxH..... 138 [+1.0] x 68[+0.7] mm
Connection	screw/plug terminals depending
	On connector 1.5 mm ² or 2.5 mm ²
Front	insulating surface
Protection System / Sealing	with correct installation
Front	IP42
Front	IP54 (with gasket P/N 8923-1037)
Back	IP20
Weight	approx. 800 g
Disturbance test (CE)	tested according to applicable EN guidelines
Listings	CE, UL/cUL listing for ordinary locations
Marine (Pending)	LR (Type Approval), ABS (Type Approval)

DIMENSIONS



TERMINAL DIAGRAM



RELATED PRODUCTS

- Load Share Synchronizer **SPM-D2-10** (Product Specification # 37622)
- Digital Synchronizer and Load Control **DSL2-2** (Product Specification # 37493)
- Master Synchronizer and Load Control **MSLC-2** (Product Specification # 37494)
- Load Share speed control **2301E** (Product Specification # 03404)
- Load Sharing Module **LSM** (Product Specification # 82686)
- **SPM-A** Synchronizer (Product Specification # 82383)
- **Power Generation Learning Module** (Product Specification # 03412): P/N 8447-1012

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For more information contact:

FEATURES OVERVIEW

SPM-D2-11 Series	SPM-D2-11/LSXR	
Measuring / Display		
Generator/System A voltage		2-ph
Busbar/System B voltage		2-ph
Generator/System A current		1-ph
Control		
Breaker		1
Synchronization		2-ph
Isolated Operation		✓
Dead bus start functionality		On-demand
SPM-A synchronization modes		✓
Maine parallel operation#1		✓
Controller		
Discrete raise/lower: Speed/Load		✓#2
Discrete raise/lower: Voltage/Power Factor		✓#2
Analog Output: Speed/Load		✓#3
Analog Output: Voltage/Power Factor		✓#3
PWM Output: Speed/Load		✓#4
Active power setpoint: 0/4 to 20mA		✓
Load/var sharing		✓
I/Os		
Discrete alarm inputs		4
Discrete outputs		7
Analog outputs: +/- 10 V, +/- 20 mA, PWM; configurable		-
USB Serial interface		1
Protection		
Generator: Over-/under-voltage (59/27)		✓
Generator: Over-/under-frequency (81O/U)		✓
Generator: Overload (32)		✓
Generator: Reverse power (32R)		✓
Generator: Reduced power (32F)		✓
Accessories		
Configuration via PC (ToolKit)		✓
Listings/Approvals		
UL / cUL Listing (61010 ,6200)		✓
CE Marked		✓
Part Numbers		
Measuring inputs 100 V _{AC} , .../5 A		8440-2165
Measuring inputs 400 V _{AC} , .../5 A#5		8440-2169

#1 Additional mains decoupling relay such as Woodward easYprotec or HighPROTEC required
 #2 Configurable to either speed/load or voltage/power factor
 #3 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)
 #4 Speed bias output configurable as 500 Hz PWM output with adjustable voltage level
 #5 All units with 400V measuring inputs can also be used for 100 V system voltage