**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-D2-10 series are 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-D2-10 synchronizers provide automatic frequency, phase and voltage matching using either analog- or discrete output bias signals. These synchronizers are 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-D2-10 synchronizers are available in 3 base models:
- **SPM-D2-10**: provides 1-phase / 2-wire voltage measurement with options for analog and/or discrete biasing signals and wide range power supply
- **SPM-D2-10 /YB**: provides 3-phase / 4-wire voltage measurement with discrete biasing signals and option for wide range power supply
- **SPM-D2-10 /PSY5**: provides 1-phase / 2-wire voltage measurement with discrete biasing signals, option for wide range power supply and 2 sets of switchable parameter set.

**FEATURES**

- Phase match or slip frequency synchronization with voltage matching
- Two-Phase or three-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
- 2 setting blocks, each containing 7 configurable parameters (in PSY5 variants) selectable through DI: Frequency/Voltage control dead-band, Frequency/Voltage control time pulse, Frequency/Voltage control gain, Circuit breaker time compensation
- Control outputs: Discrete raise/lower for speed and voltage in all variants, | X and XN variants: also configurable analog signals (Voltage, Current and PWM)
- Voltage and frequency control in isolated operation
- Two line bright liquid crystal display for operation, alarm, measuring values visualization and parametrisation
- 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

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

- Synchronization for one or two circuit breakers
- Frequency, Phase and Voltage Matching
- Selectable control outputs for speed and voltage biasing
- Compatible with a wide range of GOVs and AVRs
- Circuit breaker time compensation
- Two lines bright LCD display for generator and bus values
- Front face synchronoscope for easy commissioning
- True RMS measurement for reliable operation
- Configurable through HMI or PC
- Wide range power supply available
- Switchable parameter sets available
- CE Marked (RoHS 2 compliant)
- UL/cUL Listed
### SPECIFICATIONS

**Power supply**

<table>
<thead>
<tr>
<th>Standard</th>
<th>12/24 Vdc (9.5 to 32 Vdc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[N, XN and NYB Packages]</td>
<td>90 to 250 Vac / 120 to 375 Vdc</td>
</tr>
<tr>
<td>Intrinsic consumption</td>
<td>max. 10 W</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-20 to 70 °C</td>
</tr>
<tr>
<td>[N, XN and NYB Packages]</td>
<td>-20 to 60 °C</td>
</tr>
</tbody>
</table>

**Ambient humidity**

-95%, non-condensing

**Voltage**

- [1] 100 Vac
- Rated (V<sub>rated</sub>)
  - Max. value (V<sub>max</sub>)
  - Rated surge volt. (V<sub>surge</sub>)
  - [1] 2.5kV
  - [4] 4.0 kV

**Current**

- Rated (I<sub>rated</sub>)
- Linear measuring range
  - 3.0 x I<sub>rated</sub>
- Burden
  - < 0.15 VA
- Rated short-time overcurrent (1 s)
  - [1] 50 x I<sub>rated</sub>, [5] 10 x I<sub>rated</sub>

**Discrete inputs**

- Input range
  - 12/24 Vdc or 18 to 250 Vac/dc
- Input resistance
  - approx. 6.8 kOhms or 68 kOhms

**Relay outputs**

- Contact material: AgCdO
- Load (GP) (V<sub>cont, relay output</sub>) AC: 2.00 A @250 Vac
  - DC: 2.00 A @24 Vdc / 0.36 A @125 Vdc / 0.16 A @250 Vdc
- Pilot Duty (PD) AC: 1.00 A @24 Vdc / 0.22 A @125 Vdc / 0.10 A @250 Vdc

**Analog Outputs (isolated)**

- Type: ± 10 V / ± 20 mA / PWM
- Insulation voltage (continuously, AVR out)
  - ± 10 V (scalable)
  - maximum load 500 Ohms
- Insulation voltage (continuously, Gov out)
  - ± 10 V (scalable)
  - maximum load 500 Ohms

**Housing**

- Front panel flush mounting
- Type: APRANORM DIN 43 700

**Dimensions**

<table>
<thead>
<tr>
<th>W x H</th>
<th>144 x 72 mm</th>
</tr>
</thead>
</table>

**Protection System / Sealing**

- Front: IP42 with correct installation
- Front: IP54 (with gasket P/N 8923-1037)
- Back: IP20

**Weight**

- approx. 800 g

**Listings**

- Tested according to applicable IEC standards
- CE, UL/cUL listing for ordinary locations
- Marine (Pending)
  - LR (Type Approval), ABS (Type Approval)

### DIMENSIONS

![Diagram of the device with dimensions](image-url)
NOTE

The terminals used for connection depend on the implemented functionality of each package. The drawing below gives an overview with sample package XN – for details please see the dedicated Technical Manual listed in the features table at the rear page.

RELATED PRODUCTS

- Load Share Synchronizer SPM-D2-11 (Product Specification # 37623)
- Digital Synchronizer and Load Control DSLC-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
### FEATURES OVERVIEW

<table>
<thead>
<tr>
<th>Package</th>
<th>X</th>
<th>N</th>
<th>XN</th>
<th>PSYS</th>
<th>PSYS...W</th>
<th>YB</th>
<th>NYB</th>
</tr>
</thead>
</table>

#### Measuring / Display
- Generator/System A voltage
- Busbar/System B voltage

#### Control
- **Breaker**
- **Synchronization**
- **Isolated Operation**
- **Dead bus start functionality**
- **Switchable parameter**

#### Controller
- **Discrete raise/lower: Speed**
- **Discrete raise/lower: Voltage**
- **Analog Output: Speed**
- **Analog Output: Voltage**
- **PWM Output: Speed**

#### IOs
- **Discrete alarm inputs**
- **Discrete outputs**
- **Analog outputs: +/- 10 V, +/- 20 mA, PWM; configurable**
- **USB Serial interface**

#### Power Supply
- **24 Vdc**
- **Wide Range: 90 to 250 Vac / 120 to 375 Vdc**

#### Accessories
- **Configuration via PC (ToolKit)**

#### Listings/Approvals
- **UL / CUL Listing (61010, 6200)**
- **CE Marked**

#### Part Numbers
- **Measuring inputs 100 Vac:**
- **Measuring inputs 400 Vac:**

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