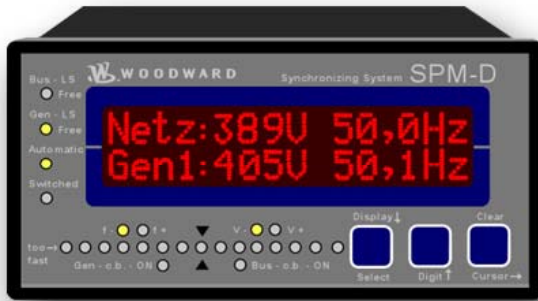


# SPM–D Synchronizer



## APPLICATIONS

The Woodward SPM–D is a micro processor based synchronizer designed for use on three phase AC generators equipped with Woodward or other compatible speed controls and compatible Automatic Voltage Regulators.

Optional Mains Failure Recognition and generator protection with addition of one Current Transformer input.

## DESCRIPTION

Woodward’s SPM–D synchronizer provides automatic frequency, phase slip using either analog- or discrete output bias signals.

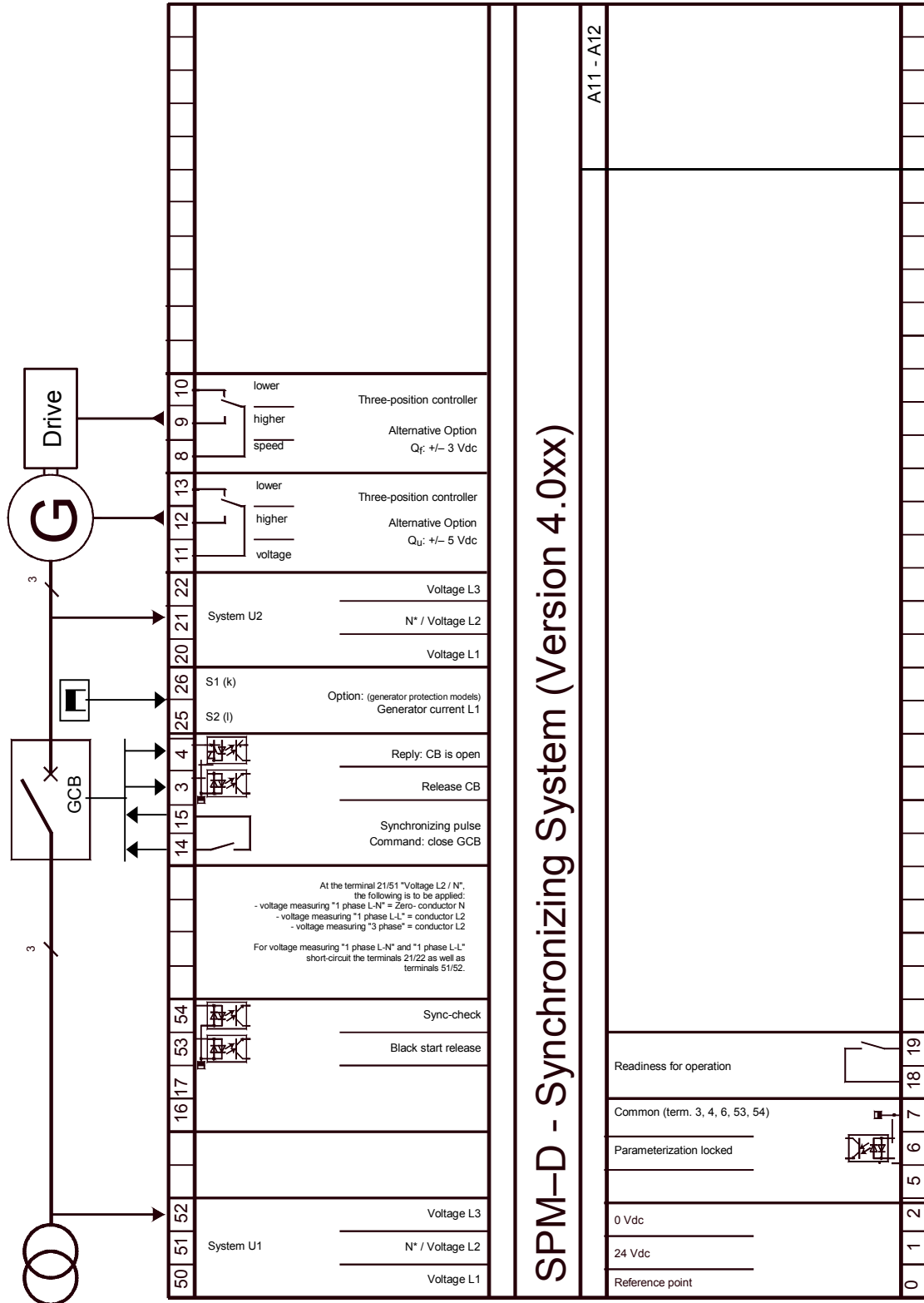
Unit comes standard with discrete raise/lower outputs for frequency and voltage. Optionally available are analog bias signals of  $\pm 3\text{Vdc}$  to interface directly to Woodward speed controls, and  $\pm 5\text{Vdc}$  for voltage bias.

The optional Mains Failure Recognition and Generator Protection model includes:

- Three phase mains over-/under voltage monitoring
- Single phase generator over-/under voltage monitoring
- Over/under frequency monitoring
- Phase shift monitoring
- Reverse and overload power monitoring

- EU directive compliant
- Available with Discrete or Analog Bias outputs for frequency and voltage
- Adjustable dynamics
- Configurable for breaker or contactor
- Slip frequency synchronizing
- Dead bus connection
- LED Synchroscope
- Optional Mains Failure Recognition and Generator Protection
- UL listed

# WIRING DIAGRAM



# SPECIFICATIONS

Measuring voltage ..... 110 Vac  
Measuring current ..... 40—70 Hz  
Power supply ..... 24 Vdc (+/-25%)  
Power consumptionmax. .... 10 W  
Ambient temperature ..... -20—70 °C  
Ambient humidity ..... 95%, not condensing

**Measuring inputs voltage..** Resistance 0.1 %  
Voltage-carrying capacity ..... 2.0 x V  
Linear measuring range up to ..... 1.3 x V  
Input resistance ..... 0.174 Mohm  
Max. power consumption per path ..... 0.15 W  
Temperature Coefficient ..... 15 ppm/K  
Max. change after endurance test ..... < 0.3 %

## Measuring input

**Current** ..... Consumption < 0.15 VA  
Current carrying capacity ..... 1.6 x I<sub>n</sub>  
Rated short time current ..... 10 x I<sub>n</sub>  
Reference voltage ..... +/-0.15%  
Max. temperature deviation ..... 12 ppm/K

Digital inputs ..... metallically separated  
Insulation voltage ..... min. 2,200 V<sub>eff</sub>  
Input range ..... 18—250 Vdc or Vac  
Input resistance ..... 68 k▶

Disturbance test (CE) ..... tested according to applicable EN guidelines

## Potential free

**Outputs** ..... Contact material: AgCdO  
Electric life cycle (ohmic load) ..... min. 100,000 switching cycles at 2 A / 250 Vac  
Load max. .... 2 A at 250 Vac or 24 Vdc  
Max. switching voltage ..... 250 Vac  
Insulation voltage ..... 2,200 V<sub>eff</sub>

**Analog inputs** freely scaleable resolution 10 Bit  
Input 0/4..20 mA, load ..... 250 ▶  
Input 0..10 V, input resistance ..... 10 k▶

**Analog outputs** freely scaleable for actual value output, metallically separated, insulation voltage 2,200 V<sub>eff</sub> ±10 V, 0—10 V, ±20 mA, 0/4—20 mA

Resolution PWM ..... 8 Bit  
Output 0/4—20 mA, max. load (V<sub>n</sub>=24 V) 400 ▶  
Output 0—10 V, ±5 V, internal resistance 1 k▶

**Housing** ..... Typ APRANORM DIN 43700  
Dimensions ..... 144 x 72 x 122 mm  
Front cutout ..... 138 x 67 mm  
Connection ..... Screw terminals 1.5 mm<sup>2</sup> or 2.5 mm<sup>2</sup>  
..... (depending on terminal connector)

**Protection system** ..... IP 21, front IP 54  
Protection class ..... II (protective insulation)  
Overvoltage category III ..... pollution degree 2

Weight (depending on model) ..... ca. 800 g

## Part numbers

### 5448-890

Digital Synchronizer, 1 synch point  
Raise/Lower discrete outputs  
UL Listed

### 5448-893

Digital Synchronizer, 1 synch point  
Analog Bias signals  
UL Listed

### 5448-891

Digital Synchronizer, 1 synch point  
Raise/Lower discrete outputs  
Mains Failure Recognition and  
Generator Protection  
UL Listed

### 5448-894

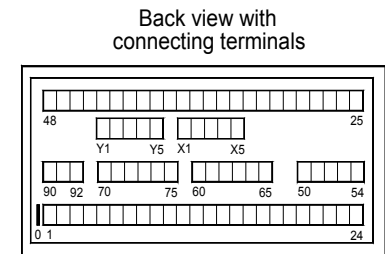
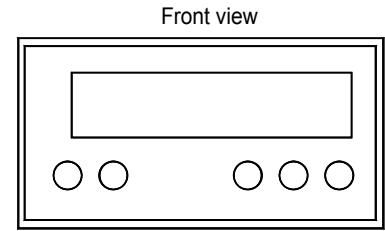
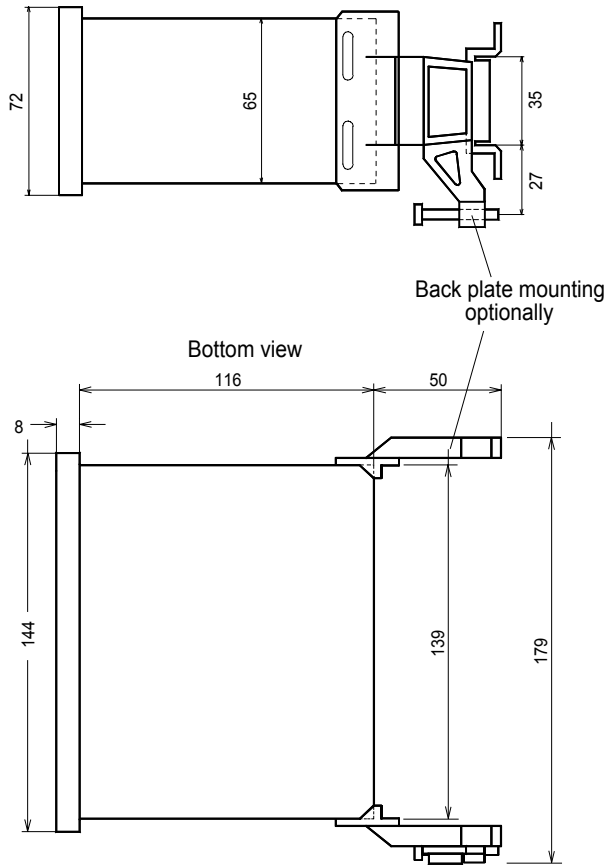
Digital Synchronizer, 1 synch point  
Analog Bias signals  
Mains Failure Recognition and  
Generator Protection  
UL Listed

Woodward/  
 Industrial Controls  
 PO Box 1519  
 Fort Collins CO, USA  
 80522-1519  
 1000 East Drake Road  
 Fort Collins CO 80525  
 Ph: (1)(970) 482-5811  
 Fax: (1)(970) 498-3058

**Distributors & Service**  
 Woodward has an international network of distributors and service facilities. For your nearest representative call (1)(800) 835-5182 or see the Worldwide Directory on our web site.

**Corporate Headquarters**  
 Rockford IL, USA  
 Ph: (1)(815) 877-7441

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



ASG 4+

1998-12-08 S4XX1508.SKD

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.

© Woodward Governor Company, 2001  
 All Rights Reserved

02/02/F

For more information contact: