

## SYNCHRO CHECK RELAY Type: SYND

### FEATURES

- **Multi function check relay**
- **Extremely compact**
- **Rail mounting for easy cabling on the baseplate**
- **Three wire interface to an optional panel indicator**
- **Microcontroller and SMD - technic for accurate and reliable function.**
- **LED indication of bus and generator status**

### Description:

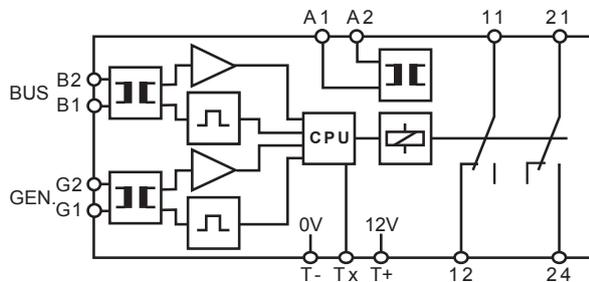
The synchro check relay type SYND is a multifunction unit that can be set to both constant or pulse output as well as to enable or disable synchronization to a "dead bus". The unit is designed with a micro controller to monitor the bus and the generator voltage, as well as the phase differential between two grids.

The SYND ensure the right conditions before the connection of the generator to the bus, in order to avoid damage to the generator and malfunction or damage to the connected equipment.

The unit is specially designed for DIN rail mounting on the base of the control box for an easy connection to the two bus systems.

For a front panel indication of the function, the SYND can be connected through a simple three wire digital interface to the optional panel indicator type SYPD.

### FUNCTION DIAGRAM

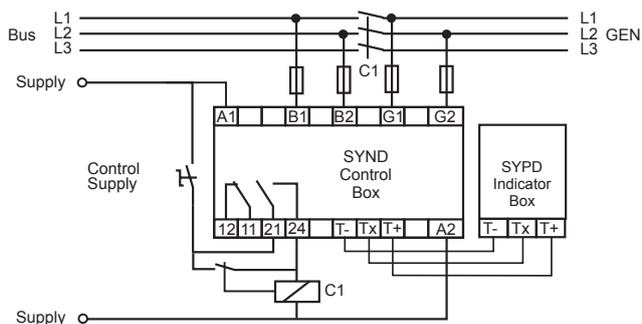


### Operation:

**Dead Bus OFF:** When the voltage on the Mains Bus, L1 - L2, and the Generator Bus, L1 - L2, both are above 75% of the nominal value, the SYND will monitor the voltage difference  $\Delta V$ . As soon as  $\Delta V$  is below the set limit, the SYND will start monitoring the phase difference  $\Delta \phi$ . If the phase difference  $\Delta \phi$  is continuously below the set limit during the elapse of the set delay time  $t_d$  and the voltages still within the limits, then the internal relay will pull in for 100 m sec. if pulse output is selected, or stay in as long as the conditions are within the limits for synchronisation.

**Dead Bus ON:** *Be careful when this function is selected. Personal injury can occur if the bus is disconnected for maintenance. Too the load of the generator can be excessive.* When the Mains Bus voltage is detected to be under the set limit, then the Mains Bus is defined to be dead and the internal relay will pull in as soon as the Generator voltage is above 75% of nominal value. The relay will drop out or stay in according to the function setting on the SYPD as described above.

### CONNECTION DIAGRAM



## SPECIFICATIONS

### INPUT

Nominal voltage	Specify from 110 to 500 V
Max. input	Unom. x 1.5
Input resistance	2 kΩ x Unom.
Voltage range	50 % to 130 %
Frequency range	35 to 70 Hz
U <sub>BUS</sub> low level	75 % fixed
U <sub>GEN</sub> low level	75 % fixed
U <sub>BUS</sub> , U <sub>GEN</sub> voltage differential	2 to 10 % / 4 to 20 % adjustable
U <sub>BUS</sub> , U <sub>GEN</sub> phase angle differential	4 to 20 degrees adjustable
Delay	0,2 to 1 sec. adjustable

### PERFORMANCE PARAMETERS

<b>ELECTRICAL</b>	
Supply dependence	< 0.01 % / % ΔU supply
Temp. dependence	< 0.02 % / °C

### OUTPUT

Sync pulse delay	200 ms. to 1sec. adjustable
Sync pulse relay	1 x C/O
Contact rating	6 A, 250 VAC, 1500 W
Mechanical life	30 Million cycles
Sync pulse	100 ms. or constant
Output for SYPD indicator	B7 0 VDC B8 Digital output B9 12 VDC

### SUPPLY

AC supply	AC voltage, Nominal ± 20 %
with transformer	24 V (19,2 to 28,8 V) 110 V (88 to 132 V) 230 V (184 to 276 V) 400 V (320 to 480 V) 440 V (352 to 528 V)
DC supply	DC Voltage, Nominal -20 % to +33 % 12V (From 9,6 to 16V) 24V (From 16 to 32V)

Frequency range	45 to 440 Hz (transformer)
Power consumption	4 VA, 3 W

### GENERAL

Temperature range	- 25 °C to + 55 °C
Humidity	Up to 90 % RH non-condensing
Dielectric test voltage	Input to AC supply 3750 VAC Coil to relay contacts 3750 VAC
Weight	0.28 kg



EMC directive 89/336:

International Standards  
EN50081 - Emission  
EN50082 - Immunity  
EN60255 - Electrical Relays

Low voltage directive 73/23:

### TYPICAL SETTING

ΔV% setting	Set for max. differential (U <sub>BUS</sub> - U <sub>GEN</sub> ) voltage in % of U <sub>GEN</sub>				
C1 closing delay	25 mS	50 mS	100 mS	200 mS	400 mS
Δφ setting	± 15 deg.	± 15 deg.	± 10 deg.	± 7 deg.	± 5 deg.
DELAY setting	0.5 sec.	0.5 sec.	0.5 sec.	0.5 sec.	0.5 sec.
Min. time for 1 rotation 0-360 deg.	6 sec.	6 sec.	9 sec.	12.86 sec.	18 sec.
Max. frequency diff.	0.17 Hz	0.17 Hz	0.11 Hz	0.08 Hz	0.06 Hz
Max. sync error	16.5 deg.	18 deg.	14 deg.	12.6 deg.	13 deg.

$$\text{Min. time for 1 rotation 0-360 deg. in sec.} = \frac{180}{\Delta\phi \text{ setting}} \times \text{delay setting}$$

$$\text{Frequency diff. in Hz} = \frac{1}{\text{time for 1 rotation 0-360 deg.}}$$

$$\text{Max. sync error in deg.} = \Delta\phi \text{ setting} + \left( \frac{\Delta\phi \text{ setting} \times 2}{\text{DELAY setting}} \times \text{C1 closing delay} \right)$$

## ORDERING INFORMATION

### EXAMPLE:

**TYPE**  
Syncho Check Relay

### VOLTAGE BETWEEN PHASES

The first three figures of the voltage in Volt e.g. 400 V

Followed by:  
1 for V = 10.0 to 99.9  
2 for V = 100 to 999

### SUPPLY

DC  
AC

012	9,6 to 16	VDC
024	16 to 32	VDC
024	19,2 to 28,8	VAC
110	88 to 132	VAC
230	184 to 276	VAC
400	320 to 480	VAC
440	352 to 528	VAC

### ADJUSTMENT

Trimpot A adjustable

### HOUSING

Rail mounting.(internal transformer)

### SIZE

55 mm.

### CODE END

