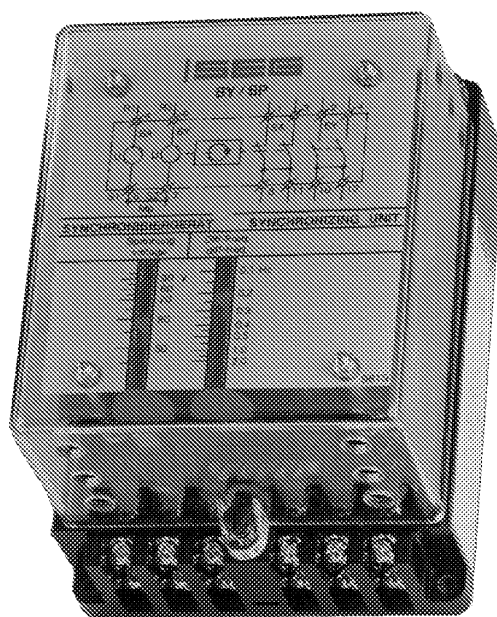


**SY/SP** - Synchronizing check relay



## Application

Unit **SY/SP** is used to prevent wrong synchronization of alternators at manual operation e.g. by unskilled personnel.

To prevent high current and mechanical stresses at paralleling the following conditions must be fulfilled before switching in parallel:

voltage difference  
frequency difference  
and phase angle must be inside limits.

Synchronizing check relay **SY/SP** monitors these values and provides closure of contact 4 - 12 if these are inside preset limits.

## Reference to other Synchronizing Systems

Semi-automatic synchronization by synchronizing unit **SY1** means:

Manual speed up or slow down the genset to equalize the frequency / manual setting of alternator voltage / monitoring of frequency difference, voltage difference and phase angle by paralleling unit **SY1** / impulse to close alternator c.b. by unit **SY1**.

Fully - automatic synchronization by frequency balancer **FN1** and paralleling unit **SY1** means:

Frequency balancer **FN1** senses the frequency difference between bus bars and genset. It provides correction pulses to the electrical governor of the driving motor to speed up or slow the generator as required for synchronization.

Voltage balancer **UN1** senses the voltage difference between bus bars and alternator. It provides correction pulses to the motorized setting potentiometer to adjust alternator voltage as required for synchronization.

Paralleling unit **SY1** monitors frequency difference, voltage difference and phase angle and provides closing impulse for the alternator C.B. With the load balancing unit **WLA2** automatic load balance can subsequently be carried out.

## Function

Synchronizing check relay **SY/SP** is to connect according to connection diagram: bus voltage to terminals a - 6 alternator voltage to terminals b - 7. All inputs are galvanical isolated and thus connection phase/neutral as well as phase/phase is possible, provided that busbar voltage, generator voltage and the connected neutral points of both systems have identical connection features.

The **SY/SP** monitors the difference in frequency and voltage as well as the phase angle of both systems and if these values are in their preset limits, switching on of the generator C.B. is released via contacts 4-12.

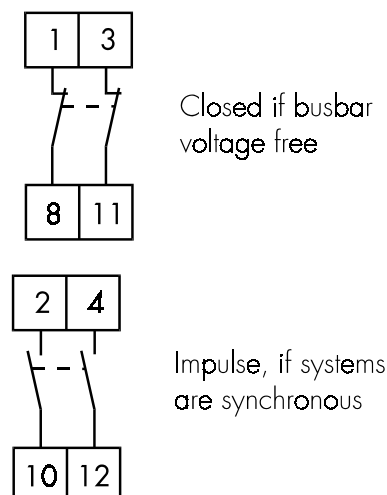
The **SY/SP** is additionally provided with a contact (3-11) which is opened when voltage is applied to terminals a-6 and closed when these terminals are dead. This contact allows closing of the generator C.B. with a dead busbar.

The **SY/SP** cannot be used for monitoring the parallel connection of synchronous systems, because for this the relay would need a "beat" of the systems to be synchronized. Since synchronous systems do not have such a "beat", the relay cannot provide release impulses even not so if the angular difference of the systems would be "0". For monitoring parallel connection of synchronous systems our paralleling unit **PSY/N** applies.

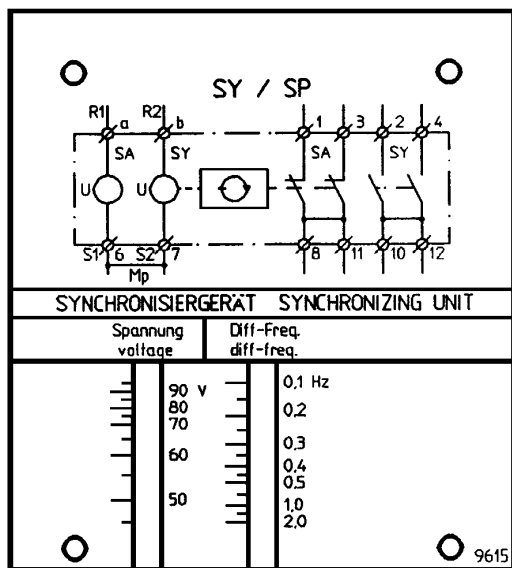
### Note for the use in marine design systems

According to German Lloyd approbation the frequency difference setting must not be more than 1 Hz.

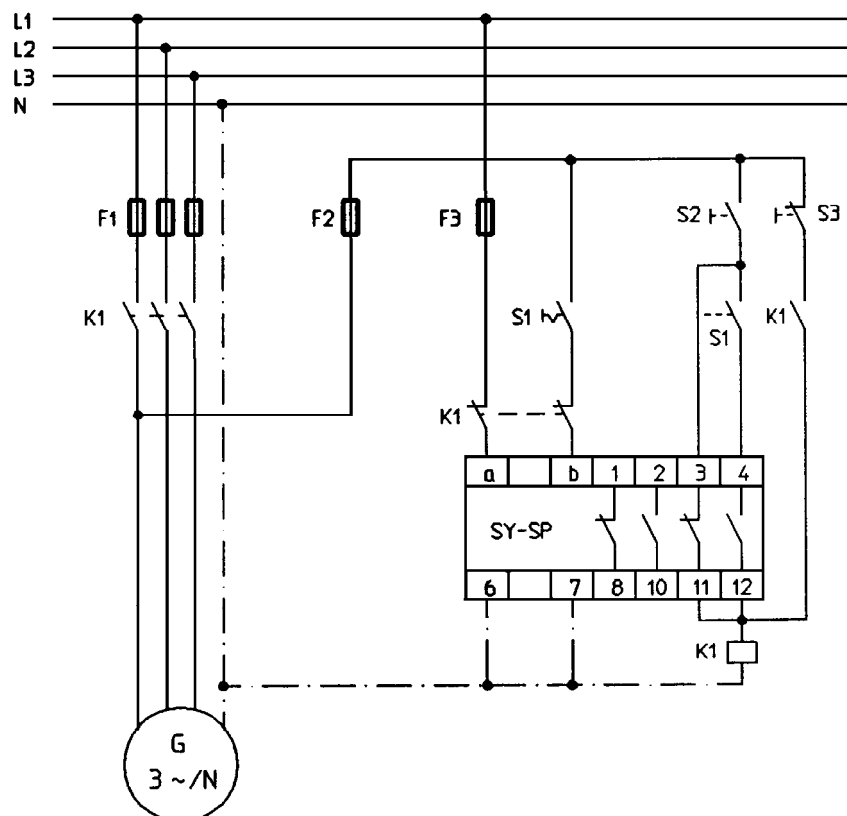
## Contact positions



## Front panel



## Connection diagram

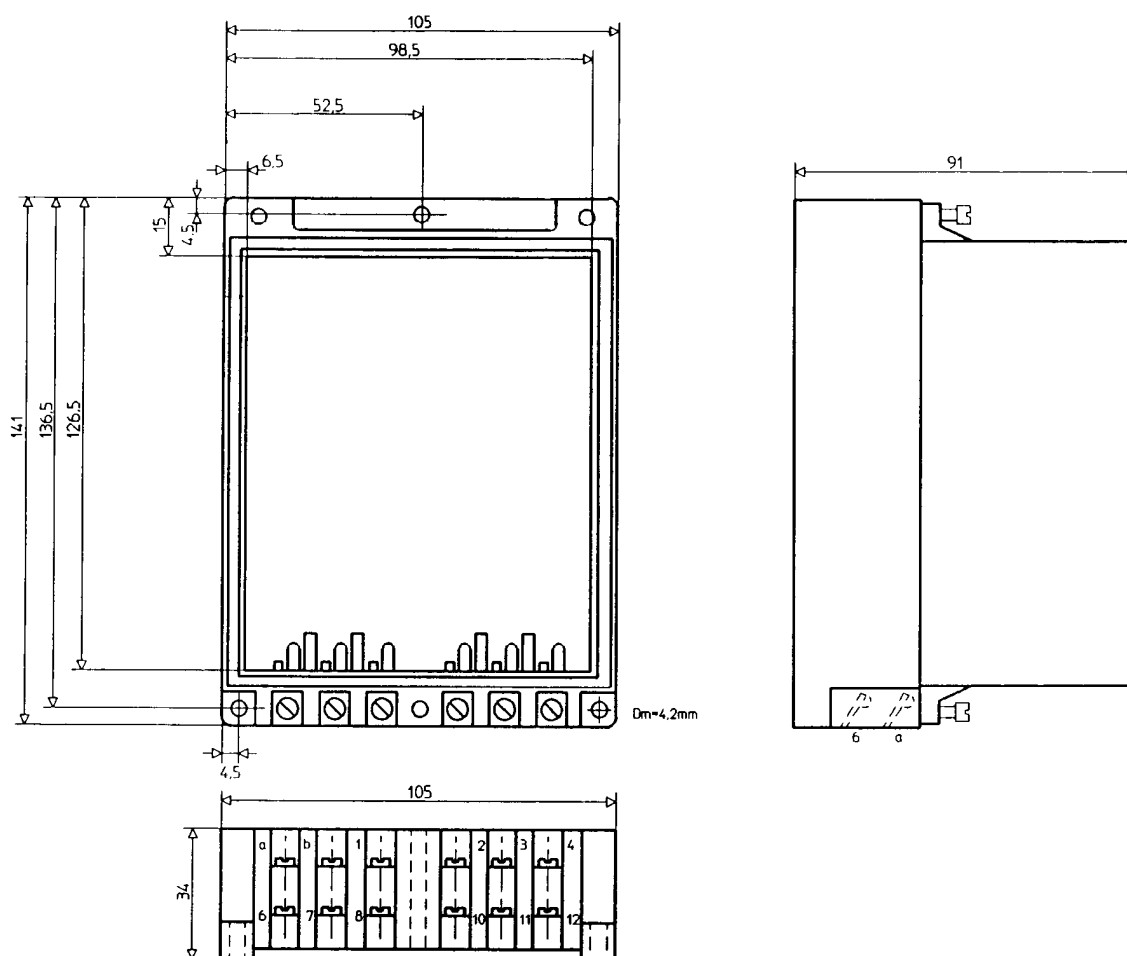


- S1 - Synchronization ON - OFF
- S2 - Generator switch ON
- S3 - Generator switch OFF
- K1 - Generator contactor

## Technical Data

Type:	SY/SP
Connection voltage:	110 V, 127 V, 230 V, 400 V
Nominal frequency:	50 Hz, 60 Hz, 400 Hz
adjustable limits of frequency difference:	0,1 ... 2 Hz
adjustable limit of voltage difference:	45 ... 95 V AC at $U_N = 230$ V and 400 V 22,5 ... 47,5 V AC at $U_N = 110$ V and 127 V (scale value x 0,5)
Consumption:	approx. 3 VA
Permissible voltage limit:	+ 10 / -15 %
Permissible switch-on time:	100 % ED
Adjustability:	Self blocking potentiometer with screw for fine adjust
Contacts:	2 NO-contact for switching in parallel 2 NC-contact for bus bar voltage
Contact power:	max. 660 VA bei 230 V AC
Case:	SEG-standard case H x B x T: 141 x 105 x 91 mm
Connection terminals:	metric 4, max. wires 2,5 mm <sup>2</sup>
Type of protection:	case IP10, terminals IP00
Mounting:	independent
Weight:	0,4 kg
Service life:	10 <sup>6</sup> switching operations
Maintenance:	none
Appendix "S" with type:	type approved for marine applications
GL - Approbation:	97 566-91 HH
URS:	92.004.272

## Dimensions and drill-holes



## Order form

Synchronizing check relay		<b>SY/SP</b>		
Number				
Connection voltage	110 V		<b>110</b>	
	127 V		<b>127</b>	
	230 V		<b>230</b>	
	400 V		<b>400</b>	
Nominal frequency	50/60 Hz		<b>50</b>	
	400 Hz		<b>400</b>	



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