

Synchronizing Unit DSY300



Application

As a fully compatible successor to the DSL synchronizing units DSY100 and DSY 200, the DSY300 is used in generating plants for synchronization with the mains network / parallel connection of current generators. Besides improvements to details of the predecessor units, it now displays the voltage difference dU with a setting range of 2 - 10%. As additional function has been included in the DSY300: a synchronizing pulse is only output when the generator frequency is higher than the mains frequency (automatic reverse power protection).

The unit is designed for heavy-duty operation in highly disturbed networks, for example USV systems and thyristor controls. This is partly achieved via the low-pass filters integrated into the voltage inputs in the standard version.

Function

The DSY300 compares the mains and generator voltage for voltage differences, frequency differences and phase position. The synchronizing relay does not switch through until all "synchronizing requirements" are met. In addition, various logical operations ensure that an accidental synchronizing pulse is not output, even in unfavourable conditions.

From voltage measurement dU , synchronization is blocked when the voltage difference set is exceeded. The output relay for synchronization is not activated until mains and generator voltage are in phase and various marginal requirements such as undervoltage monitoring, differential voltage monitoring, frequency difference monitoring and ultimate frequency monitoring ($> 3\text{Hz}$) are met as an additional security. The synchronizing pulse is output with the adjustable advance time before the voltages to be synchronized are exactly in phase (0°) in order to compensate for the switching delays of the subsequent circuit breakers. The current frequency difference between the networks is also taken into account.

Standard Settings

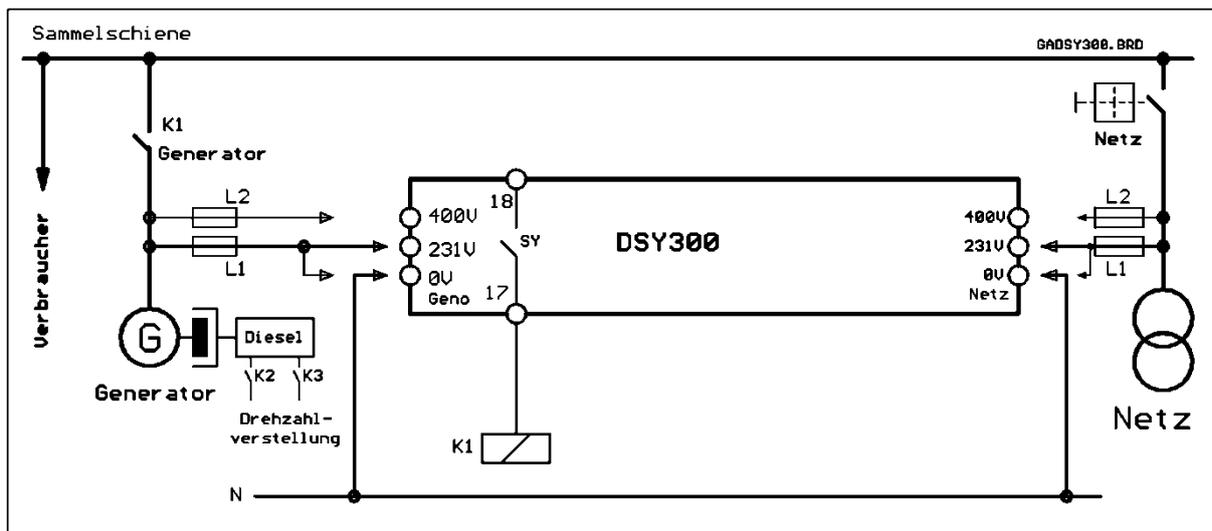
The presettings for differential frequency, differential voltage and pulse duration are made depending on the size of the generating plant and the specifications of the operator. Reference values:

Adjuster DSY300:	dF	dU	dTv
Small generators	0.6 - 1 Hz	5 - 10 %	50 - 80 ms
Medium-sized generators	0.4 - 0.6 Hz	4 - 8 %	80 - 120 ms
Large generators	0.15 - 0.5 Hz	3 - 5 %	80 -ms (spec. of the circuit breaker)

Technical Data

Type	Synchronizing unit DSY300
Construction	Plastic housing on 35mm hat rail as per DIN EN 50022 or DIN 46277
Material of housing	Bayblend FR 1439/0240 modified ABS with burning protection UL 94 V0
Dimensions, Weight	104x68x110mm (WxHxD), appr. 0,4 kg
Rated voltages	231V (L1-N) or 400V (L-L) +15/-10%, 15 minutes +20% other values on request
Rated frequency	50 Hz (60 Hz on request)
Power switch delay	10 - 250 ms
Synchronization pulse	200 ms
Voltage Difference	2% - 10%
Repeat accuracy	+/- 0,5% (0 - 60°C)
Power consumption	2,5 VA from generator voltage
On period	100 %
Contact ratings	3A/250VAC , 3A/30VDC , 0,03 Ohms , 10 ⁵ switchings
Isolating voltage	2000V (coil-contact), 1000V (open contact)
Connecting terminals	Potentialfree, for wire connections up to 2,5 mm ²
Type of protection	Housing IP 40 , Terminals IP 20 (VDE 0106T100/VBG4)
Ambient temperatures	-10 °C bis +55°C, 95% Hum
Mains isolating acc. to	EN 60 742 (save transformers)
General regulations	EN 50 178 (electrical units in power current installation)
Radio interference	EN 55 022/B
EMV acc. to	EN 61000 und EN V 50 140
Installation position	Any
Maintenance	None

Circuit Diagram



Safety Note:

The unit must be installed and taken into operation by trained personnel only. It is of particular importance to observe the correct assignment of the mains and generator voltage terminals and comply with VDE0160. Wrong polarity can cause considerable damage to equipment and injury to persons. The manufacturer gives no guarantee if excessive supply voltages are used.