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 (> 3Hz) 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 presets 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:

<table>
<thead>
<tr>
<th>Adjuster DSY300:</th>
<th>dF</th>
<th>dU</th>
<th>dTv</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small generators</td>
<td>0.6  - 1 Hz</td>
<td>5 - 10 %</td>
<td>50 - 80 ms</td>
</tr>
<tr>
<td>Medium-sized generators</td>
<td>0.4 - 0.6 Hz</td>
<td>4 - 8 %</td>
<td>80 - 120 ms</td>
</tr>
<tr>
<td>Large generators</td>
<td>0.15 – 0.5 Hz</td>
<td>3 - 5 %</td>
<td>80 - .......ms (spec. of the circuit breaker)</td>
</tr>
</tbody>
</table>
**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 VO
- **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 mm²
- **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
- **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.