

Frequency Control Unit DFN300



Application

- Static frequency control in generating plants
- Frequency adjustment (mains-controlled)
- Off-mains frequency adjustment (quartz-controlled)

Function

The DFN300 compares the frequency of an AC system with a setpoint value. If a frequency difference is detected, it provides output pulses for frequency adjustment at contacts. The value used as a setpoint is either the frequency supplied by the integrated quartz oscillator (off-mains) or the frequency of the voltage connected to the mains input terminals. Switching over to mains control is effected automatically when a mains voltage is applied.

For systems with the "parallel connection of current generators (synchronisation)" function, the "rapid synchronisation" function has been added. If the generator frequency is in phase with the mains frequency for a longer period, the "**rapid synchronisation**" functional circuit switches on automatically after 5 sec and activates the "Up" contact for running up the generator. The "Up" contact is output for the duration of the "pulse time" set. If the unit still has not passed through zero after 5 seconds more, another "Up" pulse is given.

The unit automatically adjusts the correction rate to fit the frequency difference by varying the pulse pause, i.e. when the frequency difference is large, the pulse pause is small in order to achieve a greater adjustment of the actual frequency.

The pulse duration can be set. However, when the system is taken into operation this should be done in such a way that the correction process takes place rapidly and without overshooting.

It is also possible to connect a second generator voltage instead of the mains voltage. After synchronisation with the first generator, the DFN300 can be switched over to the quartz-controlled mode, thus causing both units to be adjusted to 50Hz.

The voltage inputs are galvanically isolated from each other, so that phase/phase as well as phase/neutral conductor connection are permissible.

Functional Circuits

- Functional circuit for frequency control with
 - adjustable potentiometer "pulse duration" 0.1 sec to 1.0 sec
 - "frequency difference" LED (zero voltmeter / beating), LED dark = both systems in phase
 - LED "down" pulse, output terminal: 1 normally-open contact
 - LED "up" pulse, output terminal: 1 normally-open contact
- Functional circuit "rapid synchronisation": switches on automatically
- Quartz-controlled functional circuit: voltage at mains input 0V

Technical Data

Type	Frequency control unit DFN300
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 voltage generator	231V (L1-N) or 400V (L-L) for generator and mains, other values on request
Rated frequency	50 Hz (60 Hz on request)
Repeat accuracy	+/- 0,5% (0 - 60°C)
Power consumption	2,5 VA from generator voltage
Free running (island mode)	50(60) Hz, < 0,1% accuracy (age and thermal)
On period	100 %
Contact ratings	3A/250VAC , 3A/30VDC , 0,03 Ohms , 10 ⁵ Schaltungen
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

