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Speed Controller RFR500 (Remanence Frequency Relais) Auxiliary Voltage 24VDC, Measuring Input 5 – 500VAC

- **High precision 0,05% and rapid frequency recording**
- **Simple changing of settings during operation**
- **High-contrast display**
- **Heavy-duty two-way contacts**

Application / Function

The Speed Controller RFR500 is used to monitor the starting frequency and rated frequency of generator or gensets. The RFR500 is especially used for generators with low voltages during start moment (remanence voltage low).
During starting of the generator in the range of 10 – 30Hz the 1. switchpoint is set for Fzünd to switch off the starter. The 2. switchpoint Fnenn could be used to monitor the rated frequency i.e. by setting it on 49,9Hz. With this the relay switch to “frequency reached” at 50Hz. This switchpoint is also used for monitoring underfrequency operation.
With the RFR500 the two relay switchpoints 0,5Hz to 70Hz can be set independent from each other. With an voltage input range of 5 – 500VAC an universal frequency monitoring is obtained also for other applications. Because the RFR500 monitors the connected frequency with high precision (better than 0,05%) it is also usable for monitoring of public mains.
The outputs of the frequency monitor contains two-way contacts which switch over when the value falls below or exceeds the settings and on completion of the delay time.

The DFW100 includes a microcontroller with an easy-to-use, extremely reliable high-precision menu interface. Custom applications in conjunction with program changes are possible on request.

Settings (general)

The system-specific values are set via entry of the parameters for Fzünd (start), Fnenn (rated), switching hysteresis and switching delay and can be adjusted and saved by the user at any time. The settings can be changed during operation of the unit. During the adjustment process, the frequency monitoring set beforehand stays effective until the new setting is saved.

The "Menu", "Up" and "Down" keys set the desired value. Note: The keys react with a short delay. The basic display is always the current frequency: the display returns to this if no key is pressed for 20 seconds. If an acute overfrequency or underfrequency occurs while the menu is being set, the unit automatically switches to the alarm display.

Displaying Settings

The current settings can be monitored easily by repeated pressing of the "Up" key, the corresponding settings being shown one after the other on the display as follows:

Hz Min = start-frequency limit [20.0 Hz] [factory setting]
Hyster. = hysteresis [0.2 Hz]
Delay Min = switching delay (underfr.) [0.5 sec]
Hz Max = limit for rated frequency [50.0 Hz] [factory setting]
Delay Max = switching delay (overfr.) [0.5 sec]

Changing Settings

Changing the settings starts with pushing the "Menu" key. The items "Setup", "Back" and "Language" are offered in the menu selected. The desired item is moved via the “Up” or “Down” key until it is on the bottom line. Now the desired submenu is accessed by pressing of the "Menu" key. Here the desired setting point is moved to the bottom line via the “Up” or “Down” key. After the "Menu" key is pressed once more, the value set appears (flashing) and can be adjusted to higher or lower values via the “Up” and “Down” keys. Slow pressing of the keys automatically switches the display to a higher speed of change. After changing the setting, you can return to the previous menu by pressing the menu key and you can also select and change any other desired settings. After making all necessary changes, you can return to the start menu via the menu item "Back", and there you can save the altered settings by selecting "Save" (note: keep the menu key pressed for a short time). After saving, you should check the new settings again in the normal display in order to ensure that the altered valueshave been saved.

Other Functions

Alarm When the frequency falls below the values set or exceeds them, the top line of the display for example shows <20,0 Hz! (underfrequency) or >49,9 Hz! (overfrequency). On completion of the delay time, the display flashes and the corresponding relay switches at the same time. During execution of the alarm function, the current frequency value is always displayed on the bottom line.

Reset Pressing the "Up" and "Down" keys together starts a hardware reset which should be carried out if the unit happens to crash. All settings saved last stay as they are. A reset is also carried out automatically after a short interruption of the auxiliary voltage.

Language In the first menu item "Setup", "Back" and "Language", selecting the submenu "Language" takes you to the setting "German" or "English" which you can change as required and save via "Back" and "Save".

Technical Data

Type	Speed Controller RFR500
Construction	Plastic housing on 35mm hat rail as per DIN EN 50022
Material of housing	Bayblend FR 1439/0240 modified ABS with burning protection UL 94 VO
Dimensions, Weight	55x68x110mm (WxHxD), appr. 0.2 kg
Auxiliary Voltage	18 - 36VDC 2W on terminals 1 (-) and 2 (+)
Input	5 – 500VAC, 0,5 – 70Hz on terminals 3 and 4
Prinzip of Working	Microcontroller with quarz timer, Settings to be stored into EEPROM
Display of Frequency	In Hz with 2 figures after decimal point on LCD Display
Output logic	contact f< (under) = closed during rated frequency, contact >f (over) = off during rated frequency
Working / Setting Range	Switching points for startfrequency and rated frequency (0,5 - 70 Hz) in 0.01 Hz - steps
Switching Delay (Relay)	0 - 60 seconds in 10ms sec.-steps
Switching Hysteresis	In 0.01 Hz-steps, different settings for under- and overfrequency
Accuracy	< 0.05 %
Power Consumption	1.5 – 2.5 VA from measuring signal
Drifting of Temperature	< 100 ppm
Operating Time	100 %
Output Contacts	2 change over contacts each 6A/250VAC
Voltage Protection	4000V rms (coil-contact), 4000V rms (open contact)
Terminals	Potetialfree, each terminal up to 2 wires each 2,5 mm²
Type of Protection	Housing IP 40 , terminals IP 20 (or. VDE 0106T100/VBG4)
Operating Temperature	-10 °C to +55°C, 95% Hum (> 50°C lost of contrast of LCD-display)
Potential Separation	EN 60 742 (safety transformers)
General Regulations	EN 50 178 (electrical units in power current installation)
Noise suppressions	EN 55 022/B
EMV	EN 61000 und EN V 50 140
Installation position	Any position
Maintenance	Free of maintenance

Programming and saving discrete settings via the "Menu", "Down" and "Up" keys

Value	Start	Value change	End (Save)
Hz max :	Menu->Menu->Up->Menu---------->	Down/Up ----------	->Menu->Menu->Menu->Menu
Hz min :	Menu->Menu->Menu-> ---------->	Down/Up ----------	->Menu->Menu->Menu->Menu
Hyster. :	Menu->Menu->Down->Down->Menu---------->	Down/Up ----------	->Menu->Menu->Menu->Menu
Del max :	Menu->Menu->Down->Down->Down->Menu --->	Down/Up ----------	->Menu->Menu->Menu->Menu
Del min :	Menu->Menu->Up->Up->Menu---------->	Down/Up ----------	->Menu->Menu->Menu->Menu
Language:	Menu->Up->Menu---------->	Down/Up ----------	->Menu->Menu->Menu