

Solid-state Switching Devices

3RF2900-0EA18 Converter Function Module

Main Characteristics:

- Applicable on all 3RF21, 3RF22, 3RF23 and 3RF24 devices
- No additional space requirements
- LED display
- Linear conversion
- Plug-in control terminals
- Degree of protection IP 20



Standards / Approvals:

- DIN EN 60947-4-3
- UL 508 / CSA
- CE
- C-Tick

Product Description:

With this module, analog control signals are converted into a pulse-width modulated digital signal. The strength of the analog input voltage is converted into an ON and an OFF switching time within a fixed period duration of approx. 1 second, e.g.: 3 V correspond to 0.3 s ON and 0.7 s OFF. The conversion is realized linearly between a range of 0.1 and 9.9 V.

Below a value of 0.1 V, the connected solid state switching devices is not actuated, above 9.9 V, it is permanently switched on.

The module could be used together with all 3RF21, 3RF22 solid state relays and 3RF23, 3RF24 solid state contactors with a control voltage of DC 24 V, AC/DC 24 V or DC 4 to 30 V.

In combination with the converter module it is possible to control all semiconductor-switch gear with a DC control voltage also on a AC 24 V control voltage!

Ordering Key:

3RF29	00	- 0	E	A	1	8
Function module for 3RF21,22 and 3RF23,24	Max. load current 00 = Without	Connection technology 0 = Not relevant	Switching function E = Converter	Controlled phases A = Single-phase	Control voltage 1 = 24 V AC/DC	Operating voltage 8 = Without

Main Circuit:

The function module has not contact with the main circuit!

Control Circuit A1-A2:

Type		3RF2900-0EA18	
Rated control supply voltage U_s	V	24 AC/DC	
	mA	< 25	
	V	26.5 AC	30 DC
• Current input	V	20.5 AC	18 DC
• Max. control supply voltage	Hz	50/60 ± 10 %	
• Min. control supply voltage			
Rated frequency of the control supply voltage			

Control Input 0-10 V:

Type		3RF2900-0EA18	
Analog input	V	0 ... 10	
	V	-1 ... 11	
• Permissible range	kOhm	100	
Input resistance	s	1	
Period duration, typical			

General Data:		
Ambient temperature		
During operation	°C	-25 ... 60
During storage	°C	-55 ... 80
Mounting altitude	m	0 ... 1000; at > 1000 m, please contact our Technical Assistance
Impact resistance acc. to DIN IEC 68	g/ms	15/11
Vibration resistance	g	2
Degree of protection		IP20
Electromagnetic Compatibility (EMC)		
Interference emission		
o Conducted interference voltage IEC 60 947-4-3		Class A for industrial applications ¹
o Radiated, high-frequency interference voltage IEC 60 947-4-3		Class A for industrial applications
Interference resistance		
o Electrostatic discharge acc. to IEC 61 000-4-2 (corresponds to severity 3)	kV	Contact discharge 4; air discharge 8; performance criterion 2
o Induced HF fields acc. to IEC 61 000-4-6	MHz	0.15 ... 80; 140 dB μ V; performance criterion 1
o Burst acc. to IEC 61 000-4-4	kV	2/5.0 kHz; performance criterion 1
o Surge acc. to IEC 61 000-4-5	kV	Phase-to-ground 2; phase-to-phase 1; performance criterion 2

Type		Screw connection
Connection, auxiliary/control contacts		
Conductor cross-section with or without end sleeve	mm ² mm ² AWG	1 x (0.5 ... 2.5) 2 x (0.5 ... 1.0) 20 ... 12
Stripping length	mm	7
Terminal screw		M 3
o Tightening torque	Nm	0.5 ... 0.6
D 3.5 / PZ 1	lb.in	4.5 ... 5.3

Allocation to Solid State Switching Devices:			
Applicable for the following types	Order No.	Control voltage	Connection technology
Solid state relays	3RF21 ... A 0. 3RF21 ... A 1. 3RF21 ... A 4. 3RF22 ... A .4.	Us = 24 V DC Us = 24 V AC/DC Us = 4...30 V DC Us = 4...30 V DC	Screw, spring-loaded and ring cable connection
Solid state contactors	3RF23 ... A 0. 3RF23 ... A 1. 3RF23 ... A 4. 3RF24 ... A .4. 3RF24 ... A .5.	Us = 24 V DC Us = 24 V AC/DC Us = 4...30 V DC Us = 4...30 V DC Us = 230 V AC	Screw, spring-loaded and ring cable connection

¹ **Attention!**

This product was constructed as a EMC Class A device. The use of this product in residential applications could lead to radio interferences. In such an application, additional filtering may be required.

Mounting:

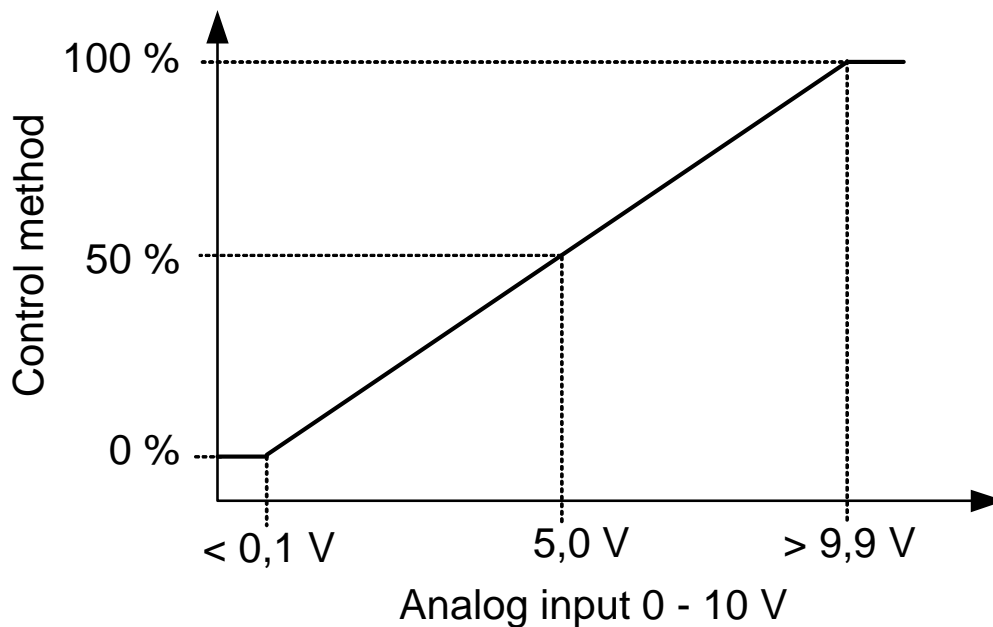
The module can be mounted onto all 3RF21, 3RF22 solid state relays and 3RF23, 3RF24 solid state contactors with a control voltage of 24 V AC/DC. After disconnection of the A1-A2 control terminal from the solid state switching devices, the converter can be snapped on. All connections to the basic device are realized thereby. The control terminal of the solid state relay or contactor is plugged into the function module's A1-A2 terminal.

For dismounting, the converter must be manually withdrawn from the device in a vertical direction.

Commissioning:

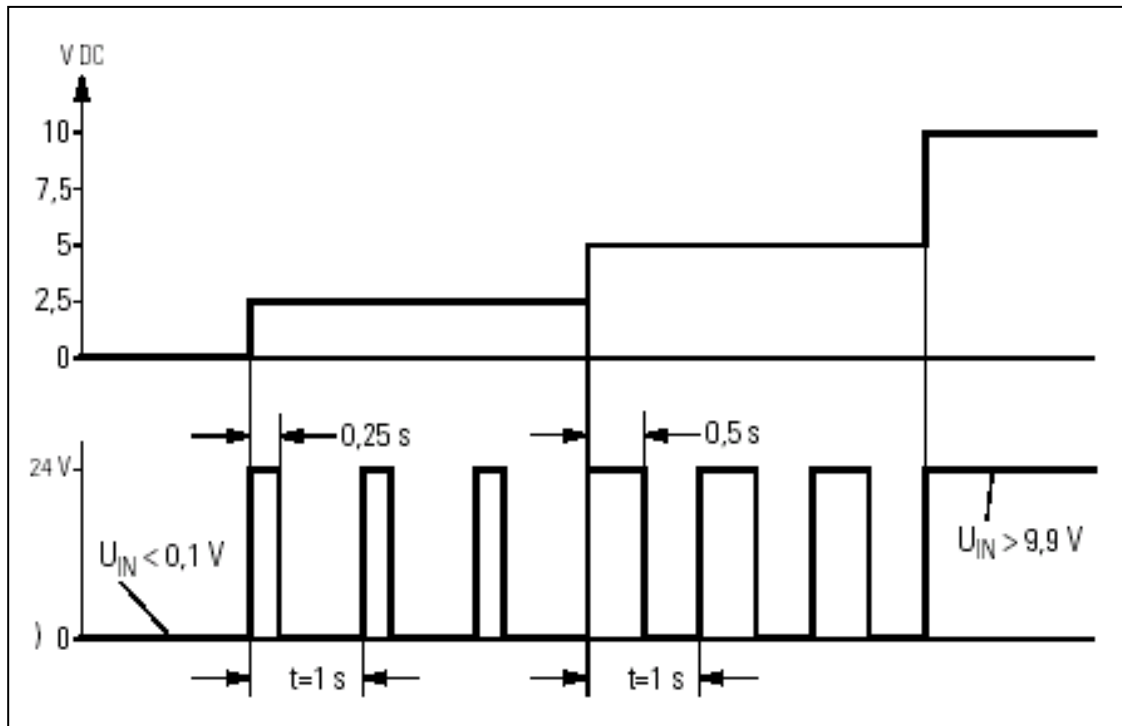
Apply a control voltage of 24 V AC/DC to terminal A1-A2. As soon as the voltage at the analog input exceeds 0.1 V, the converter switches the solid state switching device ON and OFF in accordance with the analog input voltage. For switch-off, the analog voltage must be reduced to below 0.1 V or the supply voltage must be disconnected.

Characteristic analog input 0 – 10 V:

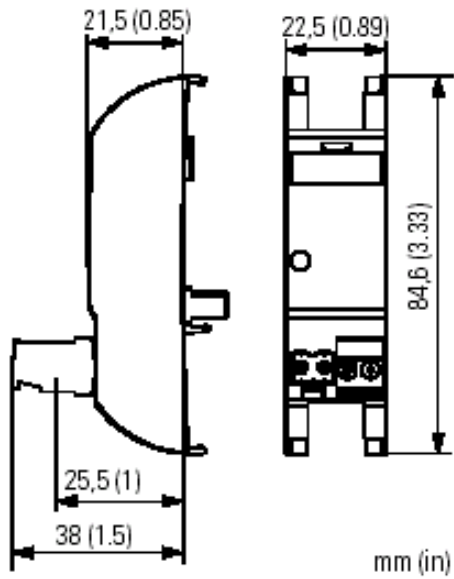


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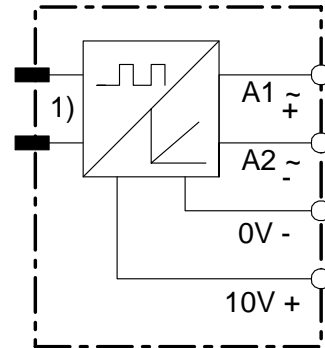
Characteristic Curve:



Dimension Drawings:

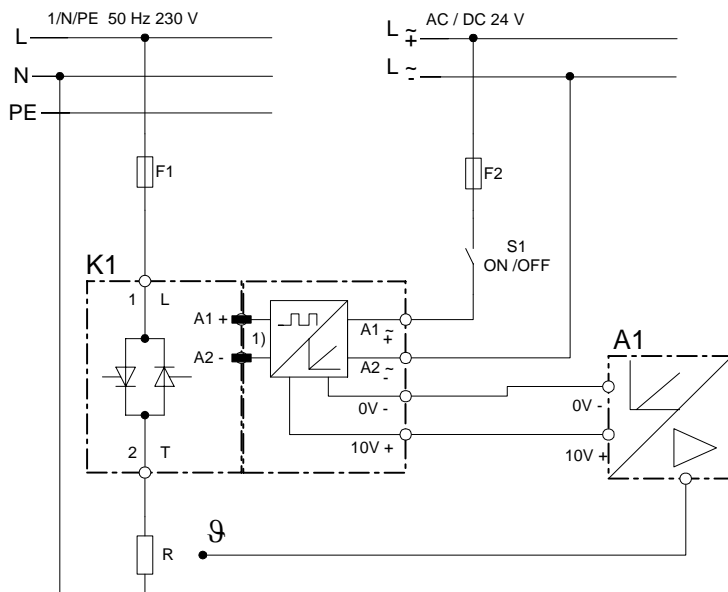


Device Circuit Diagram:



3RF2900-0EA18
Us = 24 V AC/DC

Example Circuit Diagram



- A1 Temperature controller with analog output
- F1 Main circuit fuse (semiconductor protection recommended)
- F2 Control circuit fuse
- K1 3RF2 solid state relay with plugged-on converter module
- R Load resistance
- S1 ON-/OFF-switch
- 1) Internal connection to the solid state switching device



PMA

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