

# SIEMENS

## Product Information

---

SIMATIC S7-300

Relay Output Module SM 322; DO 8 x REL AC230V/5A      Release       $\frac{x|2}{3|4}$

---

### New Relay Output Module Available

The S7-300 Relay Output Module SM 322; DO 8 × REL AC230V/5A has been added to the S7-300 family. The order number for this module is 6ES7 322-5HF00-0AB0.

This product information includes details about the characteristics and technical specifications of relay output module SM 322; DO 8 × REL AC230V/5A. Refer to the *S7-300 Installation and Hardware Manual* for more information about the S7-300 product family.

You will also learn how to start up relay output module SM 322; DO 8 × REL AC230V/5A.

### Additional Assistance

For assistance in answering technical questions, for training on this product, or for ordering, contact your Siemens distributor or sales office.

## Characteristic Features and Technical Specifications of the Relay Output Module SM 322; DO 8 × REL AC230V/5A

Order No.

6ES7 322-5HF00-0AB0

### Characteristic Features

The relay output module SM 322; DO 8 × REL AC230V/5A has the following characteristic features:

- 8 output points, isolated in groups of 1
- Load voltage 24 VDC to 120 VDC, 24 VAC to 230 VAC
- Suitable for AC/DC solenoid valves, contactors, motor starters, fractional h.p. motors and indicator lights.
- RC quenching element can be inserted for protection of the contacts by means of jumper SJ.
- Group error display
- Channel-specific status LEDs
- Programmable diagnostic interrupt
- Programmable substitute value output

## Terminal Connection Diagram and Block Diagram

Figure 1 shows the terminal connection diagram and the block diagram for the SM322; DO 8 x REL AC230V/5A Output Module.

The detailed technical specifications for this relay output module are on the following pages.

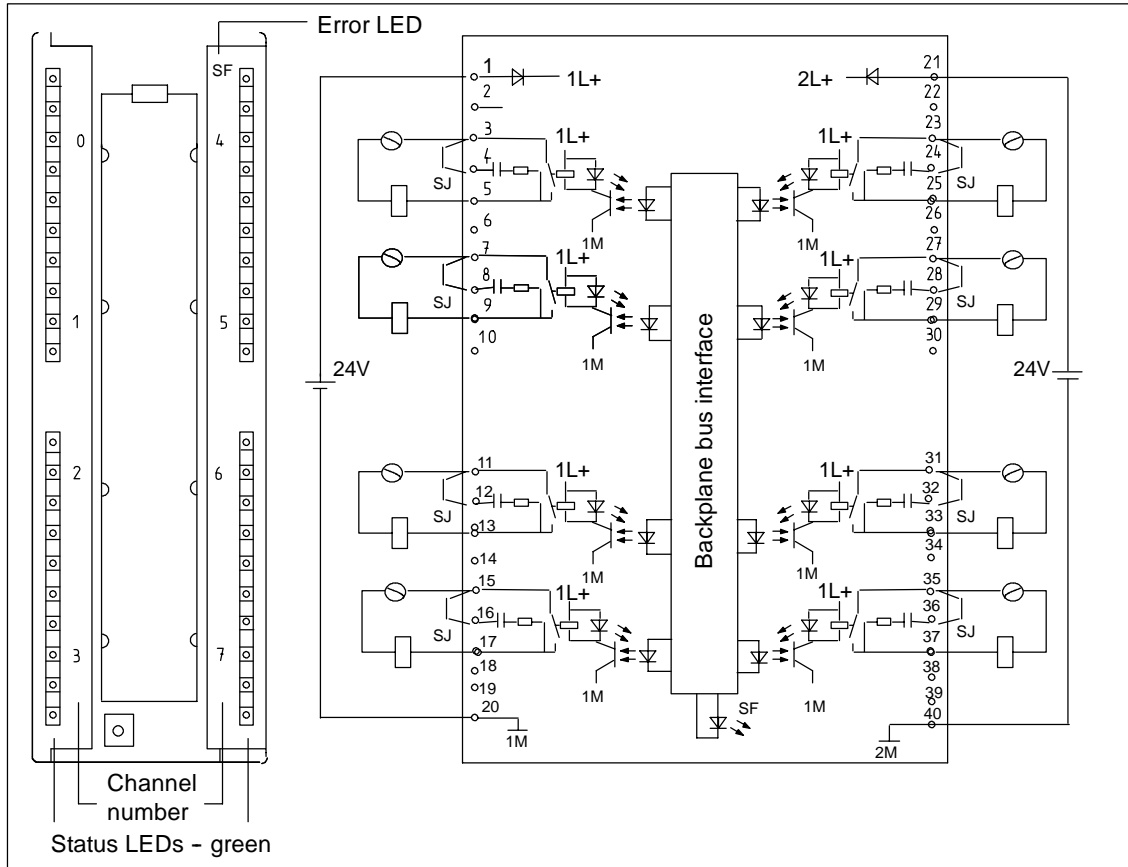


Figure 1 Module View and Block Diagram of the Relay Output Module SM 322; DO 8 x REL AC230V/5A

## Protection of Contacts against Overvoltages

To protect the contacts against transient overvoltages insert jumpers (SJ) on the module between terminals 3 and 4, 7 and 8, 12 and 13, etc., see Figure 1.

## Operation with Safe Electrical Extra-Low Voltage

When using relay output module 6ES7 322-5HF00-0AB0 with safe and electrically isolated extra-low voltage, take the following special characteristic into account.

If a terminal is operated with a safe and electrically isolated extra-low voltage, the horizontally adjacent terminal must be operated at a rated voltage of not more than UC120 V. For operation at voltages greater than UC120 V, the creepages and clearances of the 40-pin front connector do not meet the SIMATIC requirements for safe electrical isolation, see Figure 2.

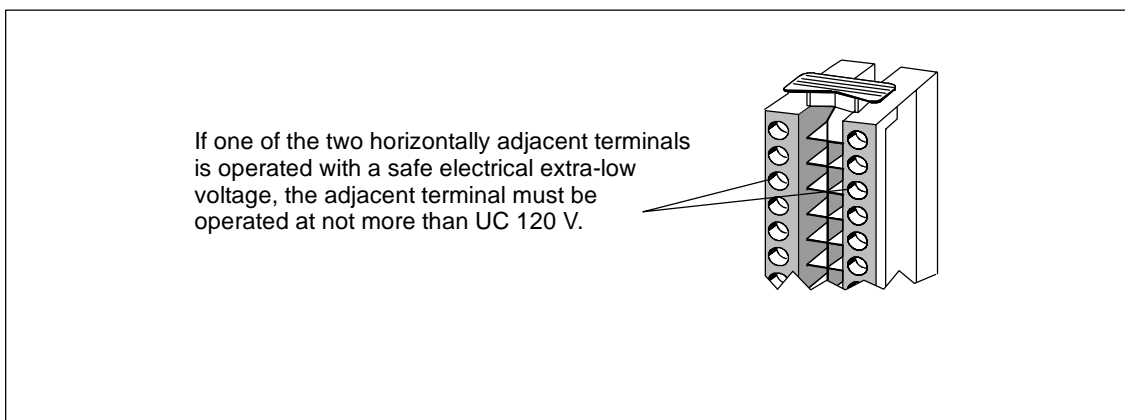


Figure 2 Special Characteristics for Operation with a Safe Electrical Extra-Low Voltage

## Technical Specification of the SM 322; DO 8 x REL AC230V/5A

Dimensions and Weight		Insulation Tested with	
Dimensions W × H × D	40 × 125 × 120mm (1.56 × 4.88 × 4.68 in.)	<ul style="list-style-type: none"> <li>Between M<sub>internal</sub> and power supply of the relays</li> </ul>	500 VAC
Weight	approx. 320 g (11.3 oz.)	<ul style="list-style-type: none"> <li>Between M<sub>internal</sub> or power supply voltage of the relay and the outputs</li> </ul>	1500 VAC
Data for Specific Module		<ul style="list-style-type: none"> <li>Between the outputs of the different groups</li> </ul>	2000 VAC
Number of inputs	8	Current source	
Length of cable		<ul style="list-style-type: none"> <li>From the back plane bus</li> </ul>	max. 100 mA
<ul style="list-style-type: none"> <li>Unshielded</li> </ul>	max. 600 m (218 yd.)	<ul style="list-style-type: none"> <li>From the power supply L+</li> </ul>	max. 160 mA
<ul style="list-style-type: none"> <li>Shielded</li> </ul>	max. 1000 m (1090 yd.)	Power dissipation of the module	
Voltage, Currents, Potentials		typ. 3.5 W	
Power rated voltage of the electronics L+	24 VDC	Status, Interrupts, Diagnostics	
<ul style="list-style-type: none"> <li>Reverse polarity protection</li> </ul>	Yes	Status display	Green LED per channel
Total current of the outputs (per group)		Interrupts	
<ul style="list-style-type: none"> <li>Horizontal configuration Up to 60° C</li> </ul>	max. 5A	<ul style="list-style-type: none"> <li>Diagnostic interrupt</li> </ul>	Parameters can be assigned
<ul style="list-style-type: none"> <li>Vertical configuration Up to 40° C</li> </ul>	max. 5A	Diagnostics functions	Parameters can be assigned
Isolation		<ul style="list-style-type: none"> <li>Group error display</li> </ul>	Red LED (SF)
<ul style="list-style-type: none"> <li>Between channels and backplane bus</li> </ul>	Yes	<ul style="list-style-type: none"> <li>Diagnostics information can be displayed</li> </ul>	Possible
<ul style="list-style-type: none"> <li>Between channels and power supply of the relay</li> </ul>	Yes	Data for Selecting an Actuator	
<ul style="list-style-type: none"> <li>Between the channels in groups of 1</li> </ul>	Yes 1	Continuous thermal current	max. 5A
Permitted potential difference		Minimum load current	10 mA <sup>1)</sup>
<ul style="list-style-type: none"> <li>Between M<sub>internal</sub> and power supply of the relay</li> </ul>	60 VAC / 75 VDC	Leakage current	11.5 mA <sup>2)</sup>
<ul style="list-style-type: none"> <li>Between M<sub>internal</sub> or power supply voltage of the relay and the outputs</li> </ul>	250 VAC	Short-circuit current according to IEC 947-5-1	With circuit-breaker of characteristic B for : cos φ 1.0:600A cos φ 0.5 - 0.7:900A With diazed 8A fuse: 1000A
<ul style="list-style-type: none"> <li>Between the outputs of the different groups</li> </ul>	500 VAC	External fuse for relay outputs	8A

Data for Selecting an Actuator (continued)		
Switching capacity and lifetime of the contacts		
For resistive load		
Voltage	Current	No. of switching cycles (typ.)
24 VDC	5.0 A	0.2 mill
24 VDC	2.5 A	0.4 mill
24 VDC	1.0 A	0.9 mill
230 VAC	5.0 A	0.2 mill
230 VAC	2.5 A	0.4 mill
230 VAC	1.0 A	0.9 mill
For inductive load according to IEC 947-5-1, 13 DC/15 AC		
Voltage	Current	No. of switching cycles (typ.)
24 VDC	5.0 A	0.1 mill
24 VDC	2.5 A	0.25 mill
24 VDC	1.0 A	0.5 mill
230 VAC	5.0 A	0.1 mill
230 VAC	2.5 A	0.25 mill
230 VAC	1.0 A	0.5 mill
You can attain greater service life by connecting an RC quenching element (by inserting an SJ jumper) or with external protective circuitry.		
Size of motor starter lamp	max. size 5 to NEMA lamp	
	Power	No. of switching cyc. (typ.)
Lamp Load (230 VAC)	1000W	25000
	1500 W	10000
Energy-saving lamps/fluorescent lamps with electronic ballast	10x58 W	25000
Fluorescent lamps, conventionally compensated	1x58 W	25000
Fluorescent lamps, non-compensated	10x58 W	25000

Contact protection	RC quenching element 330 Ω, 0.1uF
Connecting two outputs in parallel	
<ul style="list-style-type: none"> <li>For redundant triggering of a load</li> </ul>	Possible (only outputs with identical load voltage)
<ul style="list-style-type: none"> <li>To increase performance</li> </ul>	Not possible
Triggering a digital input	Possible
Switch rate	
<ul style="list-style-type: none"> <li>Mechanical</li> </ul>	max. 10Hz
<ul style="list-style-type: none"> <li>For resistive load</li> </ul>	max. 2Hz
<ul style="list-style-type: none"> <li>For inductive load according to IEC 947-5-1, 13 DC/15 AC</li> </ul>	max. 0.5Hz
<ul style="list-style-type: none"> <li>For lamp load</li> </ul>	max. 2Hz

Note<sup>1</sup>: Without inserted "SJ" jumper

Note<sup>2</sup>: For AC load voltage and inserted "SJ" jumper. (Without "SJ" jumper inserted there is not a leakage current).

NOTE: Due to the leakage current of the RC quenching element, connecting a relay output point directly to a single AC input point with the "SJ" jumper inserted is not recommended.

## Assigning Parameters to the SM 322; DO 8 x REL AC230V/5A

### Parameterization

To find a description of the general procedure for assigning parameters to digital modules, refer to Section 3.3 of the *S7-300 and M7-300 Programming Controllers Module Specifications Manual*.

For details of the parameters of the of the digital output module, see appendix A.3 of the *S7-300 and M7-300 Programming Controllers Module Specifications Manual*.

### Parameters of the SM 322; DO 8 x REL AC230V/5A

Table 1 shows an overview of the parameters that you can set and their default setting for the SM 322; DO 8 x REL AC230V/5A

These default settings apply, if you have not performed parameter assignments in STEP 7.

Table 1 Parameters and Default Settings for the Digital Output Module SM 322; DO 8 x REL AC230V/5A.

Parameter	SM 322; DO 8 x Rel AC230V/5A		Parameter Type	Scope
	Value Range	Default Settings		
Enable Diagnostics Interrupt	Yes/No	No	Dynamic	Module
Behavior on CPU STOP	Apply substitute value (EWS) Hold last value(LWH)	EWS	Dynamic	Channel
Apply substitute value "1"	Yes/No	No	Dynamic	Channel

## Behavior and Diagnostics of the SM 322; DO 8 x Rel AC230V/5A

### Diagnostic Messages of the SM 322; DO 8 x Rel AC230V/5A

Table 2 provides an overview of the diagnostic messages of the SM 322; DO 8 x Rel AC230V/5A.

Table 2 Diagnostic Messages of the SM 322; DO 8 x Rel AC230V/5A

Diagnostic Message	LED	Scope of the Diagnostics	Parameters can be Assigned
Watchdog timeout	SF	Module	No
EPROM error	SF	Module	No
RAM error	SF	Module	No

### Causes of Error and Remedial Action

Table 3 shows possible causes of errors and remedial action to correct the problem.

Table 3 Diagnostic messages of the SM 322; DO 8 x Rel AC230V/5A, Causes of Error and Remedial Action

Diagnostic Message	Error Detection...	Possible Error Cause	Remedy
Watchdog timeout	Always	Temporary high electromagnetic interference	Eliminate interference and switch on/off power supply of CPU
		Module defective	Replace module
EPROM error	Always	Temporary high electromagnetic interference	Eliminate interference and switch on/off power supply of CPU
		Module defective	Replace module
RAM error	Always	Temporary high electromagnetic interference	Eliminate interference and switch on/off power supply of CPU
		Module defective	Replace module



# Interrupts of the SM 322; DO 8 x Rel AC230V/5A

## Introduction

The SM 322; DO 8 x Rel AC230V/5A can trigger diagnostic interrupts.

The OBs and SFCs mentioned below can be found in the online help for STEP 7, where they are described in greater detail.

## Enabling Interrupts

The interrupts are not present. They are inhibited without appropriate parameter assignment. Assign parameters to the Interrupt Enable in STEP 7.

## Diagnostic Interrupt

If you have enabled diagnostic interrupts, then active error events (initial occurrence of the error) and departing error events (message after troubleshooting) are reported by means of an interrupt.

The CPU interrupts the execution of the user program and processes the diagnostics interrupt block (OB 82).

In the user program, you can call SFC 51 or SFC 59 in OB 82 to obtain more detailed diagnostic information from the module.

The diagnostic information is consistent until such time as OB 82 is exited. When OB 82 is exited, the diagnostic interrupt is acknowledged on the module.