8.2 DO479

8.2.1 General Information

The DO479 is a standard digital output module.

8.2.2 Order Data

Model Number	Short Description	Image
3DO479.6	2005 digital output module, 16 transistor outputs 24 VDC, 0.5 A, 2 electrically isolated output groups. Order TB170 terminal block separately.	
3TB170.9	2005 terminal block, 20-pin, screw clamps	
3TB170.91	2005 terminal block, 20-pin, cage clamps	
3TB170:90-02	2005 terminal block, 20-pin, 20 pcs., screw clamps	
3TB170:91-02	2005 terminal block, 20-pin, 20 pcs., cage clamps	
Terminal blocks not included in the delivery (see "Accessories").		

Table 133: DO479 order data

8.2.3 Technical Data

Product ID	DO479
C-UL-US Listed	Yes
B&R ID Code	$40
Number of Outputs Total in 2 Groups of	 16 8
Design	Transistor

Table 134: DO479 technical data

Product ID	DO479
Electrical Isolation Output - PLC Group - Group Output - Output	 Yes Yes No
Switching Voltage Minimum Nominal Maximum	 19.5 VDC 24 VDC 30 VDC
Continuous Current per Output Group Module	 Max. 0.5 A Max. 4 A Max. 8 A
Leakage Current when Switched Off	0.3 mA
Switching Delay Log. 0 - Log. 1 Log. 1 - Log. 0	 Typ. 5 µs / max. 110 µs Typ. 60 µs / max. 100 µs
Switching Frequency (resistive load)	Max. 500 Hz
Overload Protection	Yes
Switching On after Overload Cutoff	Automatically after approx. 5 s
Short Circuit Current	0.75 to 1.5 A
Protective Circuit Internal External	 Yes Only if necessary (surge)
Braking Voltage when Switching Off Inductive Loads	45 to 55 V
Power Consumption Internal 5 V 24 V Total Terminal Side at 24 V	 Max. 1 W --- Max. 1 W Max. 2 W per Group
Dimensions	B&R 2005 single-width

Table 134: DO479 technical data (cont.)

8.2.4 Status LEDs

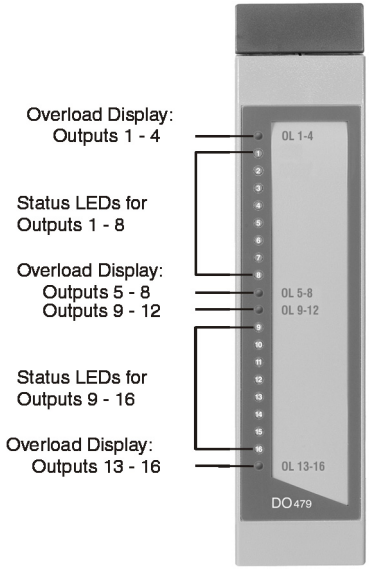
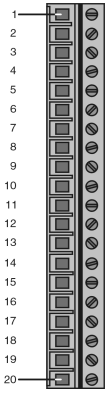
Image	LED	Description
	1 - 16	The status LEDs indicate the logical status of the corresponding outputs.
	OL x-y	The LEDs OL x-y (overload) indicate that the overload or short circuit cutoff has been activated for the respective LED group. If e. g. the OL 1-4 LED is lit, it means that a transistor (output 1, 2, 3 or 4) has been switched off (for more information see Section 8.2.7 "Overload Protection", on page 254).

Table 135: DO479 status LEDs

8.2.5 Pin Assignments



TB170

Connection	Assignment	
1	+24 V supply for inputs 1 - 8	Group 1
2	Output 1	
3	Output 2	
4	Output 3	
5	Output 4	
6	Output 5	
7	Output 6	
8	Output 7	
9	Output 8	
10	GND for output 1 - 8	
11	GND for output 9 -16	Group 2
12	Output 9	
13	Output 10	
14	Output 11	
15	Output 12	
16	Output 13	
17	Output 14	
18	Output 15	
19	Output 16	
20	+24 V supply for inputs 9 -16	

Table 136: DO479 pin assignment

When connecting the terminal block, it is important to ensure that any potential difference does not exceed 50 V. This is valid for:

Potential Difference <50 V
Group ↔ Group
+24 V connection ↔ PLC ground
+24 V connection ↔ ground

Table 137: DO479 the potential difference must be smaller than 50 V

Both electrically isolated groups can also be supplied by 2 separate 24 V sources.

Connection Example

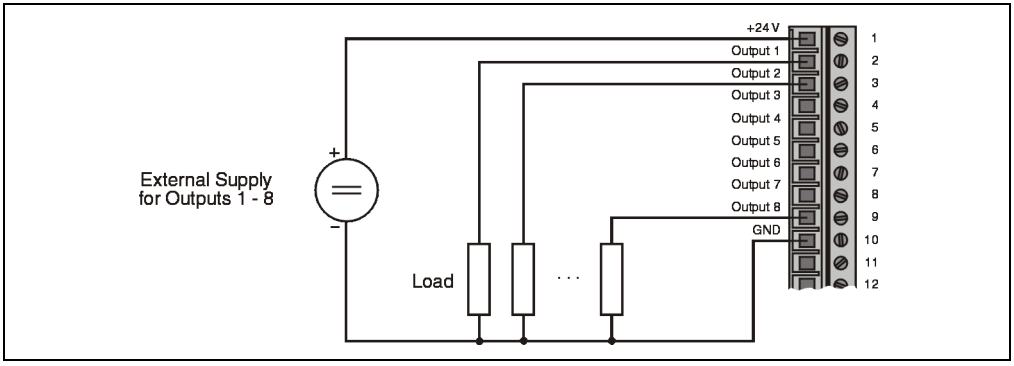


Figure 98: DO479 connection example

8.2.6 Output Circuit Diagram

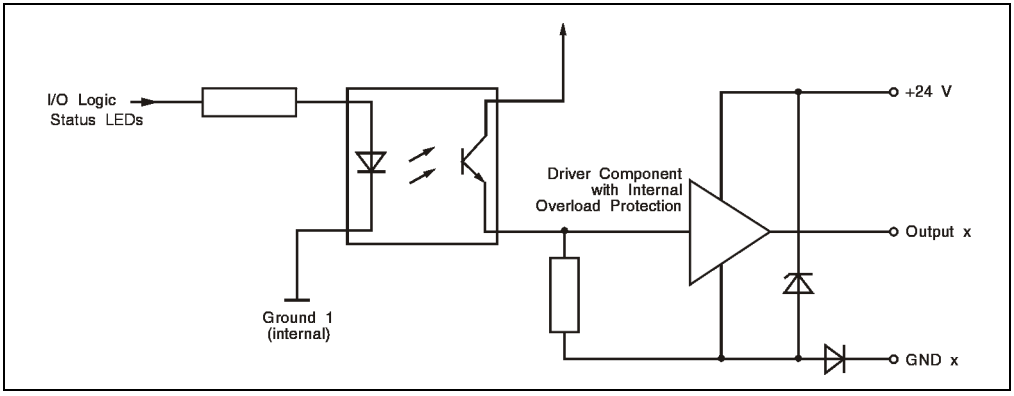


Figure 99: DO479 output circuit diagram

8.2.7 Overload Protection

The overload protection is activated in the following cases:

- Junction temperature for transistors exceeds the limit value (typ. 150° C, min. 135° C, max. 175° C). Causes: Short circuit, overload or environmental temperature is too high.
- The 24 V supply voltage (terminal side) is smaller than typ. 13 V (min. 10 V, max. 14.5 V).

The affected output remains switched off until ...

... the junction temperature is again within the limit value (hysteresis typ. 20° C). The time until it is switched on again is within seconds.

... the voltage supply is again within the valid range (typ. >14.5 V).

8.2.8 Switching Inductive Loads

Transistors are suitable for switching inductive loads off quickly and safely. Inverse diodes are not necessary on inductive loads. It should be noted that the maximum switching frequency at a given inductance is limited by a set braking voltage of 45 V to 55 V.

Braking Voltage: is a negative voltage on the switching element (e.g. valve). If the switching element is unable to operate with a negative voltage, an external inverse diode must be installed to limit the voltage to approx. -0.6 V.

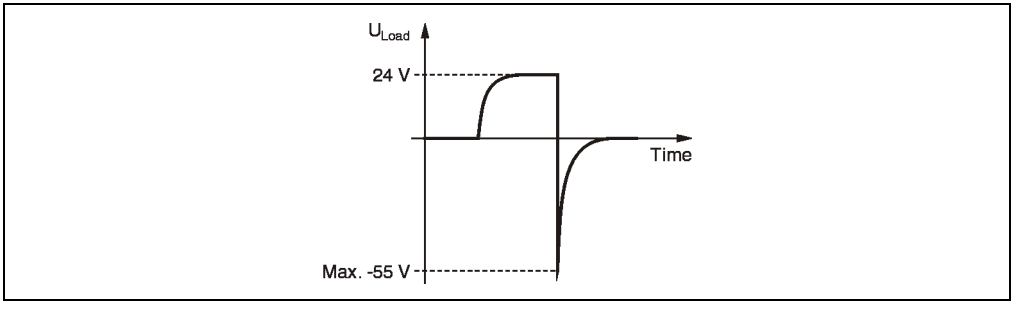


Figure 100: DO479 schematic representation for braking voltage

The maximum switching frequency decreases as the inductance increases. A coil with an inductivity of 0.5 H can be easily switched with 0.5 Hz at 24 V / 0.5 A and 60° C environmental temperature.

The maximum switching frequency in relation to a given inductance can be seen from the following diagram.

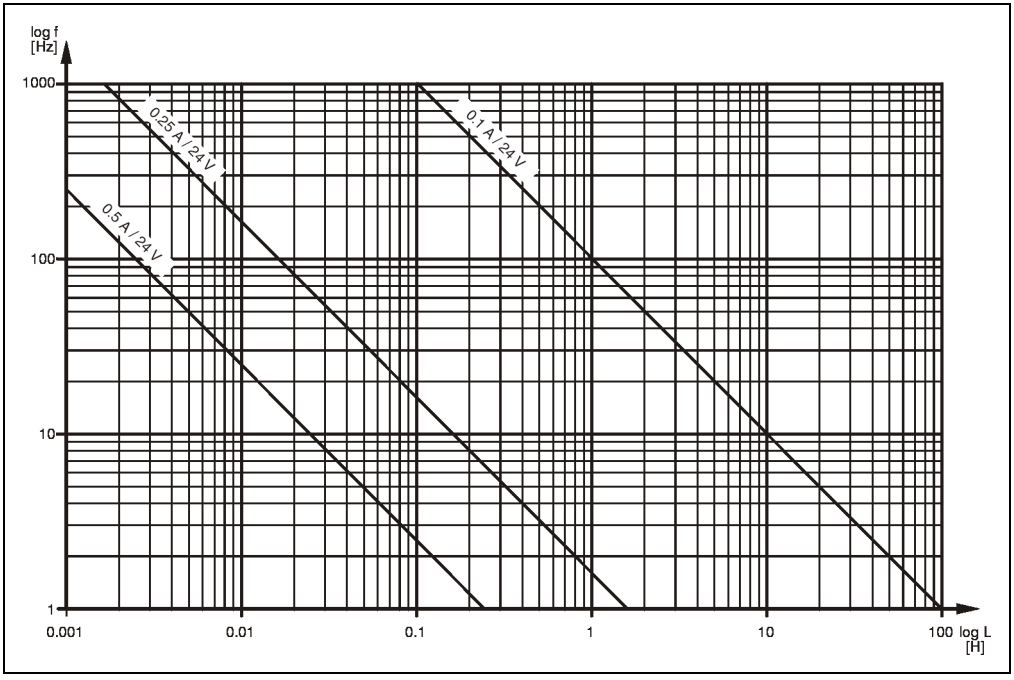


Figure 101: DO479 switching frequency in relation to a given inductance

8.2.9 Variable Declarations

The variable declaration is made in B&R Automation Studio™:

Function	Variable Declarations				
	Scope	Data Type	Length	Module Type	Chan.
Single digital output (channel x)	tc_global	BOOL	1	Digit. Out	1 ... 16

Table 138: DO479 variable declaration