

1.1 DO479

1.1.1 General information

The DO479 is a standard digital output module.

1.1.2 Order data


Model number	Short description	Figure
3DO479.6	2005 digital output module, 16 transistor outputs 24 VDC, 0.5 A, 2 electrically isolated output groups, order 2 x TB170 terminal blocks separately	
3TB170.9	2005 terminal block, 20-pin, screw clamps	
3TB170.91	2005 terminal block, 20-pin, cage clamps	
Terminal blocks not included in the delivery (see "Accessories").		

Table 1: DO479 - Order data

1.1.3 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
Electrical isolation Output - PLC Group - Group Output - Output	Yes Yes No
Switching voltage Minimum Rated 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 2: DO479 - Technical data

1.1.4 Status LEDs

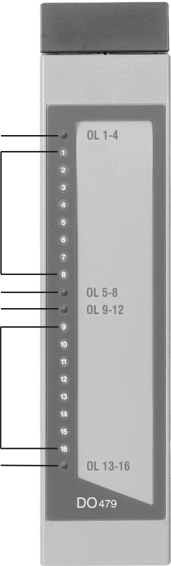
Figure	LED	Description
 <p>Overload indicator: Outputs 1 - 4</p> <p>Status LEDs for Outputs 1 - 8</p> <p>Overload indicator: Outputs 5 - 8 Outputs 9 - 12</p> <p>Status LEDs for Outputs 9 - 16</p> <p>Overload indicator: Outputs 13 - 16</p>	1 - 16	The status LEDs indicate the logical status of the corresponding 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 (outputs 1, 2, 3 or 4) has been switched off (for more information see section 1.1.7 "Overload protection" on page 6).

Table 3: DO479 - Status LEDs

1.1.5 Pin assignments

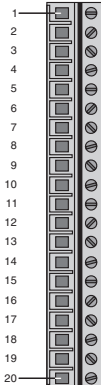
	Connection	Name	
 <p>TB170</p>	1	+24 V supply for outputs 1 - 8	Group 1
	2	Output 1	
	3	Output 2	
	4	Output 3	
	5	Output 4	
	6	Output 5	
	7	Output 6	
	8	Output 7	
	9	Output 8	Group 2
	10	GND for output 1 - 8	
	11	GND for output 9 - 16	
	12	Output 9	
	13	Output 10	
	14	Output 11	
	15	Output 12	
	16	Output 13	
	17	Output 14	
	18	Output 15	
	19	Output 16	
	20	+24 V supply for outputs 9 - 16	

Table 4: DO479 - Pin assignments

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

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

Table 5: 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

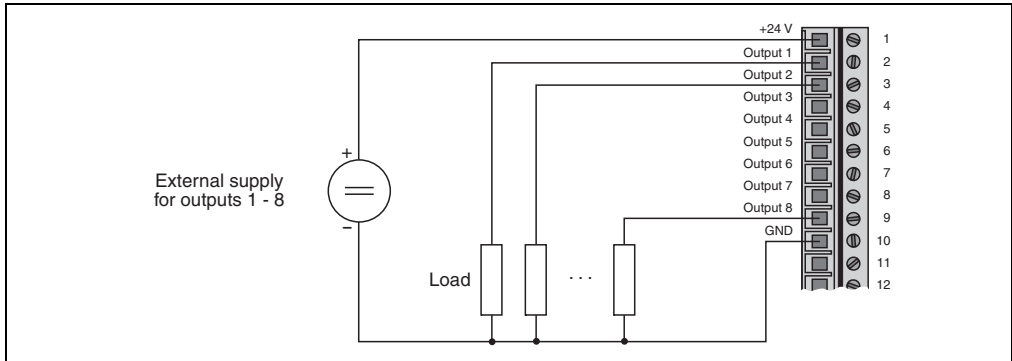


Figure 1: DO479 - Connection example

1.1.6 Output circuit diagram

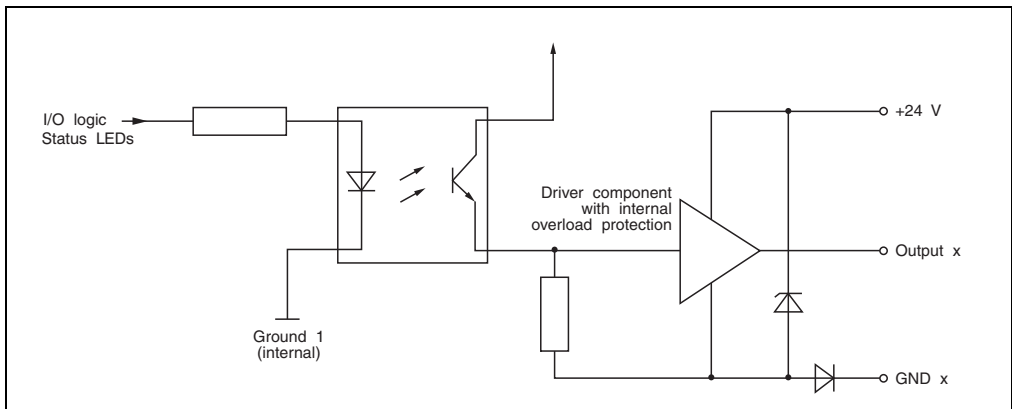


Figure 2: DO479 - Output circuit diagram

1.1.7 Overload protection

Overload protection is enabled 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 ambient 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).

1.1.8 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.

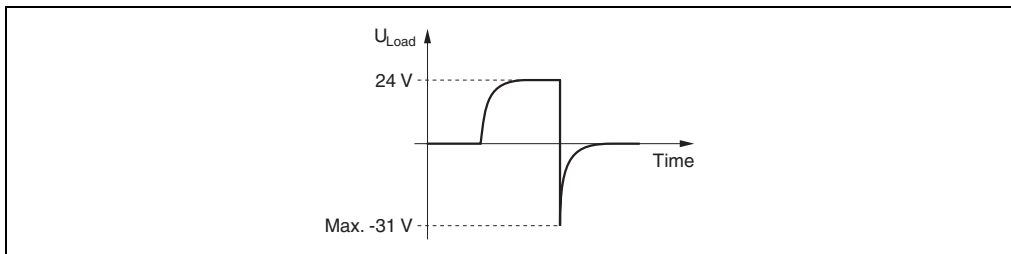


Figure 3: DO479 - Schematic representation for braking voltage

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 ambient temperature.

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

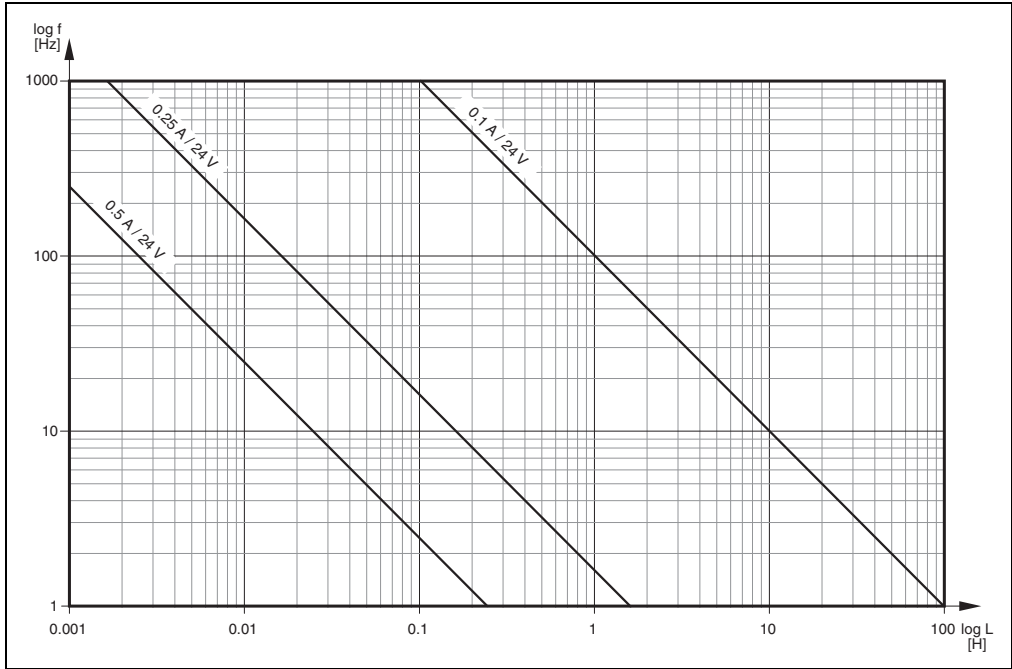


Figure 4: DO479 - Switching frequency with respect to a given inductance

1.1.9 Variable declaration

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

Function	Variable declaration				
	Scope	Data type	Length	Module type	Channel
Single digital output (channel x)	tc_global	BOOL	1	Digit. out	1 ... 16

Table 6: DO479 - Variable declaration