

## Advantech AE Technical Share Document

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<b>Category</b>	<input checked="" type="checkbox"/> FAQ <input type="checkbox"/> SOP	<b>Related OS</b>	N/A
<b>Abstract</b>	What's the difference between ADAM-6060 and ADAM-6066 relay output module?		
<b>Keyword</b>	Relay, Contact Rating, Relay lift time		
<b>Related Product</b>	ADAM-6060, ADAM-6066		

■ **Problem Description:**

Customers have questions on the contact rating and the lite time of relay on ADAM-6060 and ADAM-6066. This document explains how to read the spec from the relay and what's the difference with different types of load.

■ **Answer:**

Below is the relay spec of ADAM-6060 and ADAM-6066 in the manual. As you can see, there is a difference in contact rating between ADAM-6060 and ADAM-6066. What's the meaning of contact rating? A relay component is consisting of a coil and normally two contacts. When the electricity goes across the coil, it activates the electromagnet generating a magnetic field that attracts a contact to turn on or off the circuit loop. When the contacts open carrying a current, an arc often forms in the gap between them, which damages the contacts. Therefore, the contact rating is the voltage/current that the switch can repeatedly connect and interrupt without degrading the relay's design life-cycle operation count. Take ADAM-6066 for example, the maximum safe operation current is 5A in 250VAC and 3A in 30VDC while the maximum safe operation current of ADAM-6060 is 0.5A in 120VAC and 1A in 30VDC. That's why ADAM-6066 is called power relay which could sustain more power loaded.

It should be noted that the contact rating in the manual is for resistive type load. The relay on/off capability with inductive load such as motor is affected by the electromagnetic energy stored in the inductive load, so the safe operation current is lower compare to resistive load.

<b>Relay Output (Form A)</b>	
▪ Channels	6
▪ Contact Rating (Resistive)	ADAM-6060: 120 V <sub>AC</sub> @ 0.5 A 30 V <sub>DC</sub> @ 1 A ADAM-6066: 250 V <sub>AC</sub> @ 5 A 30 V <sub>DC</sub> @ 3 A
▪ Breakdown Voltage	500 V <sub>AC</sub> (50/60 Hz)
▪ Relay On Time	7 ms
▪ Relay Off Time	3 ms
▪ Total Switching Time	10 ms
▪ Insulation Resistance	1 GΩ min. at 500 V <sub>DC</sub>
▪ Maximum Switching Rate (at rated load)	20 operations/minute
▪ Supports Pulse Output	

*Figure 1 Relay Spec of ADAM-6060/6066*

The life time of relay is the question which is usually asked by customers. The life time of relay is normally defined as mechanical endurance which means the number of **operations (OPS)** the relay can successfully complete without any electrical load. The mechanical endurance of ADAM - 6066 is  $2 \times 10^7$  OPS and ADAM – 6060 is  $1 \times 10^8$  OPS.

The other question is that why the voltage rating of AC is much higher than DC? The main limitation in switching DC is the contact ability to break the arc that forms at the contact surface. When operating in AC, the voltage and current falls to zero and reverses polarity rapidly. The arc is subsequently extinguished. When operating in DC, the voltage and current keep same value which let arcs could form and sustain. If the connected load exceeds the relay's contact capacity or switching ability, arc heat will melt the contacts. That's why DC load conditions will be more stringent than the AC load conditions.