# TECHNICAL BULLETIN

**[Issue No.]** T11-0004 **[Page]** 1/2
**[Title]** Caution when using digital to analog converter module **[Date of Issue]** June, '03
**[Relevant Models]** Q62DA, Q64DA, Q68DAI

Thank you for your continued support of Mitsubishi programmable logic controllers, MELSEC-Q series.

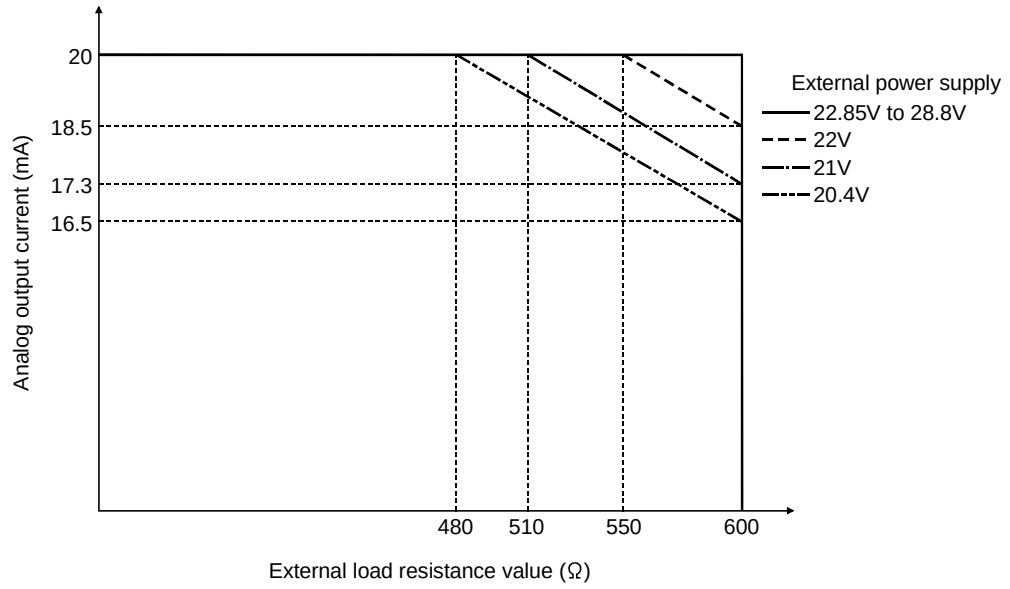
When the Q-series digital to analog converter module (Q62DA, Q64DA or Q68DAI) satisfies all of the conditions shown in 1 (1) to (3), the analog output current and the external load resistance value vary within the range given in the performance specifications list. (If any of (1) to (3) is not satisfied, the following caution is not applied.)

## 1. Conditions

(1) The current output is used.
(2) The external load resistance value exceeds 480Ω.
(3) The external power supply voltage is less than 22.85V DC.

## 2. Caution

The following shows the analog output current and the external load resistance value when the external power supply voltage is less than 22.85V DC.
Determine the external power supply voltage referring to the graph below.




Remarks

This caution is not applied to the digital to analog converter modules other than the 3 models indicated above.

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Table 3.1 Performance specifications list (Reference)

<table>
<tr><th colspan="3">Item \ Model name</th><th>Q62DA</th><th>Q64DA</th><th>Q68DAV</th><th>Q68DAI</th></tr>
<tr><td colspan="3">Number of analog output points</td><td>2 points (2 channels)</td><td>4 points (4 channels)</td><td colspan="2">8 points (8 channels)</td></tr>
<tr><td colspan="3">Digital input</td><td colspan="4">16-bit signed binary (normal resolution mode: -4096 to 4095,<br>high resolution mode: -12288 to 12287, -16384 to 16383)</td></tr>
<tr><td rowspan="2">Analog output</td><td>Voltage</td><td></td><td colspan="3">–10 to 10 V DC (External load resistance value: 1 k Ω to 1M Ω)</td><td>—</td></tr>
<tr><td>Current</td><td></td><td colspan="2">0 to 20 mA DC<br>(External load resistance value: 0 Ω to 600 Ω)</td><td>—</td><td>0 to 20 mA DC<br>(External load resistance value<br>: 0 Ω to 600 Ω)</td></tr>
<tr><td colspan="3">I/O characteristics,<br>Maximum resolution</td><td colspan="4"><table>
<tr><th colspan="2" rowspan="2">Analog output range</th><th colspan="2">Normal resolution mode</th><th colspan="2">High resolution mode</th></tr>
<tr><th>Digital input value</th><th>Maximum resolution</th><th>Digital input value</th><th>Maximum resolution</th></tr>
<tr><td rowspan="4">Voltage</td><td>0 to 5V</td><td rowspan="2">0 to 4000</td><td>1.25 mV</td><td rowspan="2">0 to 12000</td><td>0.416 mV</td></tr>
<tr><td>1 to 5V</td><td>1.0 mV</td><td>0.333 mV</td></tr>
<tr><td>-10 to 10V</td><td rowspan="2">-4000 to 4000</td><td>2.5 mV</td><td>-16000 to 16000</td><td>0.625 mV</td></tr>
<tr><td>User range setting</td><td>0.75 mV</td><td>-12000 to 12000</td><td>0.333 mV</td></tr>
<tr><td rowspan="3">Current</td><td>0 to 20 mA</td><td rowspan="2">0 to 4000</td><td>5 μA</td><td rowspan="2">0 to 12000</td><td>1.66 μA</td></tr>
<tr><td>4 to 20 mA</td><td>4 μA</td><td>1.33 μA</td></tr>
<tr><td>User range setting</td><td>-4000 to 4000</td><td>1.5 μA</td><td>-12000 to 12000</td><td>0.83 μA</td></tr>
</table></td></tr>
<tr><td rowspan="2">Accuracy (Accuracy in respect to maximum analog output value)</td><td>Ambient temperature 25 ± 5 °C</td><td colspan="4">Within ± 0.1 % (Voltage: ±10 mV, Current: ± 20 μA)</td></tr>
<tr><td>Ambient temperature 0 to 55 °C</td><td colspan="4">Within ± 0.3 % (Voltage: ± 30 mV, Current: ± 60 μA)</td></tr>
<tr><td colspan="3">Conversion speed</td><td colspan="4">80 μs/channel</td></tr>
<tr><td rowspan="2">Absolute maximum output</td><td>Voltage</td><td></td><td colspan="2">± 12 V</td><td>—</td></tr>
<tr><td>Current</td><td></td><td colspan="2">21 mA</td><td>—</td><td>21 mA</td></tr>
<tr><td colspan="3">E$^2$PROM write count</td><td colspan="4">Max. 100 thousand times</td></tr>
<tr><td colspan="3">Output short circuit protection</td><td colspan="4">Available</td></tr>
<tr><td colspan="3">Insulation method</td><td colspan="4">Between the I/O terminal and PLC power supply : Photo coupler insulation<br>Between output channels : No insulation<br>Between external supply power and analog output : No insulation</td></tr>
<tr><td colspan="3">Dielectric withstand voltage</td><td colspan="4">Between the I/O terminal and PLC power supply: 500VAC for 1 minute</td></tr>
<tr><td colspan="3">Insulation resistance</td><td colspan="4">Between the I/O terminal and PLC power supply: 500VDC 20M Ω or more</td></tr>
<tr><td colspan="3">Number of occupied points</td><td colspan="4">16 points</td></tr>
<tr><td colspan="3">Connected terminals</td><td colspan="4">18-points terminal block</td></tr>
<tr><td colspan="3">Applicable wire size</td><td colspan="4">0.3 to 0.75 mm$^2$</td></tr>
<tr><td colspan="3">Applicable solderless terminal</td><td colspan="2">R 1.25-3<br>(A solderless terminal with sleeve cannot be used)</td><td colspan="2">FG terminal: R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A<br>Other terminals than FG: R1.25-3 (A solderless terminal with sleeve cannot be used)</td></tr>
<tr><td colspan="3" rowspan="4">External supply power</td><td colspan="4">24 V DC + 20 %, – 15 %</td></tr>
<tr><td colspan="4">Ripple, spike 500 mV P-P or less</td></tr>
<tr><td>Inrush current: 1.9 A, within 300 μs</td><td>Inrush current: 3.1 A, within 300 μs</td><td>Inrush current: 3.3 A, within 70 μs</td><td>Inrush current: 3.1 A, within 75 μs</td></tr>
<tr><td>0.12 A</td><td>0.18 A</td><td>0.19 A</td><td>0.28 A</td></tr>
<tr><td colspan="3">Internal current consumption (5 V DC)</td><td>0.33 A</td><td>0.34 A</td><td>0.39 A</td><td>0.38 A</td></tr>
<tr><td colspan="3">Weight</td><td colspan="2">0.19 kg</td><td colspan="2">0.18 kg</td></tr>
</table>

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