**Power supply**

12VDC or 24VDC

**Permissible range**

10.2VDC to 28.8VDC with less than 10% ripple

**Maximum current consumption**

- 230mA@24VDC (pnp inputs)
- 310mA@24VDC (nnp inputs)
- 330mA@12VDC (pnp inputs)
- 360mA@12VDC (nnp inputs)

**Digital inputs**

10 pnp (source) or nnp (sink) inputs. See Note 1.

**Nominal input voltage**

12VDC or 24VDC. See Notes 2 and 3.

**Input voltages for pnp (source):**

- For 12VDC: 0-3VDC for Logic ‘0’
- For 24VDC: 8-15.6VDC for Logic ‘0’

**Input voltages for nnp (sink):**

- For 12VDC: 8-15.6VDC/1.2mA for Logic ‘0’
- For 24VDC: 17-28.8VDC/2mA for Logic ‘0’

**Input current**

- 4mA@12VDC
- 8mA@24VDC

**Input impedance**

3KΩ

**Response time**

10ms typical

**Galvanic isolation**

None

**Input cable length**

Up to 100 meters, unshielded

**High-speed counter**

Specifications below apply when inputs are wired for use as a high-speed counter input/shaft encoder. See Notes 4 and 5.

**Resolution**

32-bit

**Input frequency**

10kHz max.

**Minimum pulse**

40µs

**Note:**

To avoid electromagnetic interference, mount the controller in a metal panel/cabinet and earth the power supply. Earth the power supply signal to the metal using a wire whose length does not exceed 10cm. If your conditions do not permit this, do not earth the power supply.

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**Warnings:**

- Unused pins should not be connected. Ignoring this directive may damage the controller.
- Improper use of this product may severely damage the controller.
- Refer to the controller’s User Guide regarding wiring considerations.
- Before using this product, it is the responsibility of the user to read the product’s User Guide and all accompanying documentation.
Analog Inputs
- Two 10-bit, multi-range inputs: 0-10V, 0-20mA, 4-20mA
- Conversion method: Successive approximation
- Input impedance: >100KΩ for voltage, 500Ω for current
- Galvanic isolation: None
- Resolution (except 4-20mA): 10-bit (1024 units)
- Resolution at 4-20mA: 204 to 1023 (2^10 units)
- Conversion time: According to filter
- Absolute max. rating: ±15V
- Full scale error: ±2 LSB
- Linearity error: ±2 LSB
- Status indication: Yes, see Note

Note:
The analog value can also indicate when the input is functioning out of range.
If an analog input deviates above the permissible range, its value will be 1024.

Voltage / Current connection

Current connection

Digital outputs
- 8 relay outputs, 230VAC/12/24VDC
- Output type: SPST-NO relay
- Type of relay: Takamisawa (Fujitsu) JY-12H-K, or NAIS (Matsushita) JQ1A-12V or OMRON G6B-1114P-12VDC
- Isolation: by relay
- Output current: 5A max. (resistive load)
- 1A max. (inductive load)
- Max. frequency: 0.5Hz (at maximum rated load)
- Contact protection: External precautions required

Relay Outputs

Graphical Display
- STN, LCD display
- Illumination backlight: LED, yellow-green, software-controlled
- Display resolution: 128x64 pixels

Keypad
- Sealed membrane
- Number of keys: 16

Program
- Application memory: 448K
- Memory Bits (coils): 2048
- Memory Integers (registers): 1600
- Long Integers (32 bit): 256
- Double Word (32 bit unsigned): 64
- Floats: 24
- Timers: 192
- Counters: 24
- Data Tables: 120K (RAM) / 64K (FLASH)
- HMI displays: Up to 255
- Execution time: 0.8μs for bit operations

RS232/RS485 serial ports
- Used for:
  - Application Download/Upload
  - Application Testing (Debug)
  - Connect to GSM or standard telephone modem:
    - Send/receive SMS messages
    - Remote access programming
  - RS485 Networking
- RS232 (see note): 2 ports
- Galvanic isolation: None
- Voltage limits: ±20V
- RS485 (see note): 2 ports
- Input voltage: -7 to +12V differential max.
- Cable type: Shielded twisted pair, in compliance with EIA RS485
- Galvanic isolation: None
- Baud rate: 110 – 57600 bps
- Nodes: Up to 32

Note:
RS232/RS485 is determined by jumper settings and wiring.
Refer to the controller’s User Guide regarding communications.

I/O expansion port
- Up to 128 additional I/Os, including digital & analog I/Os, RTD and more.

CANbus port
- Up to 63 nodes
- Baud rate range: 20Kbps - 1Mbps
- Cable length: Up to 150m for 12VDC network
- Up to 1000m for 24VDC network

CANbus connection

Miscellaneous
- Clock (RTC): Real-time clock functions (Date and time).
- Battery back-up: 7 years typical battery back-up for RTC and system data.
- Battery: Coin type, 3V lithium battery, CR2450
- Weight: 320g (11.3 oz.)
- Operational temperature: 0 to 50°C (32 to 122°F)
- Storage temperature: -20 to 60°C (-4 to 140°F)
- Relative Humidity (RH): 5% to 95% (non-condensing)
- Mounting method: DIN-rail mounted (IP20/NEMA1)
  Panel mounted (IP65/NEMA4X)
The tables below show how to set a specific jumper to change the functionality of the controller. To open the controller and access the jumpers, refer to the directions at the end of these specifications.

**Important:**
Incompatible jumper settings and wiring connections may severely damage the controller.

**JP1**
**Digital inputs type**

<table>
<thead>
<tr>
<th>To use as</th>
<th>JP1</th>
</tr>
</thead>
<tbody>
<tr>
<td>npn (sink)</td>
<td>A</td>
</tr>
<tr>
<td>pnp (source)*</td>
<td>B</td>
</tr>
</tbody>
</table>

**JP5, JP6**
**Power supply voltage**

<table>
<thead>
<tr>
<th>Range</th>
<th>JP5</th>
<th>JP6</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.2 to 15.6VDC</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>15.6 to 28.8VDC*</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

**JP2**
**Digital inputs voltage**

<table>
<thead>
<tr>
<th>To use as</th>
<th>JP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>12VDC</td>
<td>A</td>
</tr>
<tr>
<td>24VDC*</td>
<td>B</td>
</tr>
</tbody>
</table>

**JP3, JP4**
**Analog inputs type**

<table>
<thead>
<tr>
<th>To use as</th>
<th>JP3 for analog input #0</th>
<th>JP4 for analog input #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage input*</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Current input</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

*Default factory setting

In this figure, the jumper settings will cause the controller to function as follows:
- Digital inputs: npn, 24VDC inputs
- Analog input #0: Voltage input
- Analog input #1: Current input
- Power supply: 24VDC

**Opening the controller’s enclosure**

1. Turn power off before opening the controller.
2. Locate the 4 slots on the sides of the enclosure.
3. Using the blade of a flat-bladed screwdriver, gently pry off the back of the controller as shown in the figure below, exposing the controller’s board.

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