

# AXL F DI16/1 DO8/2-2A 2H - Digital module



2702291

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Axioline F, Digital I/O module, Digital inputs: 16, 24 V DC, connection technology: 1-conductor, Digital outputs: 8, 24 V DC, 2 A, connection technology: 2-conductor, transmission speed in the local bus: 100 Mbps, degree of protection: IP20, including bus base module and Axioline F connectors

## Product description

The module is designed for use within an Axioline F station. It is used to acquire and output digital signals. The filter times of the inputs can be adjusted to increase noise immunity. Filter times of 100  $\mu$ s enable the user to implement a counter function with a maximum input frequency of 5 kHz in the application. The outputs are protected against short circuit and overload.

## Your advantages

- 16 digital inputs in accordance with EN 61131-2 type 1 and type 3
- 24 V DC, 2.4 mA
- Connection of sensors in 1-conductor technology
- Filter times can be adjusted in three increments: < 100  $\mu$ s, 1000  $\mu$ s or 3000  $\mu$ s
- Maximum input frequency: 5 kHz
- 8 digital outputs
- 24 V DC, 2 A
- Connection of actuators in 2-conductor technology
- Minimum update time of < 100  $\mu$ s
- Device rating plate stored

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2702291       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | DR02          |
| Product key                          | DRI233        |
| GTIN                                 | 4055626071848 |
| Weight per piece (including packing) | 203.2 g       |
| Weight per piece (excluding packing) | 111 g         |
| Customs tariff number                | 85389091      |
| Country of origin                    | DE            |

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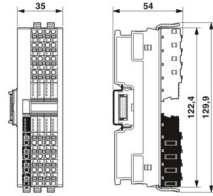


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## Technical data

### Dimensions

|                     |  |
|---------------------|--|
| Dimensional drawing |  |
| Width               | 35 mm  |
| Height              | 129.9 mm   |
| Depth               | 54 mm  |
| Note on dimensions  | The depth applies when a TH 35-7.5 DIN rail is used (in accordance with EN 60715). |

### Notes

|                     |                         |
|---------------------|-------------------------|
| Note on application |                         |
| Note on application | Only for industrial use |

### Material specifications

|                 |                 |
|-----------------|-----------------|
| Color (Housing) | gray (RAL 7042) |
|-----------------|-----------------|

### Interfaces

|                      |                 |
|----------------------|-----------------|
| Axioline F local bus |                 |
| Number of interfaces | 2               |
| Connection method    | Bus base module |
| Transmission speed   | 100 Mbps        |

### System properties

|                                  |        |
|----------------------------------|--------|
| Programming data (LocalbusSlave) |        |
| Input address area               | 2 Byte |
| Output address area              | 2 Byte |
| Fieldbus data telegram           |        |
| Required parameter data          | 3 Byte |
| Required configuration data      | 7 Byte |

### Input data

|                          |                          |
|--------------------------|--------------------------|
| Digital:                 |                          |
| Input name               | Digital inputs           |
| Description of the input | EN 61131-2 types 1 and 3 |
| Number of inputs         | 16                       |

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|                                   |   |
|-----------------------------------|---|
| Connection method                 | Push-in connection  |
| Connection technology             | 1-conductor   |
| Input voltage range "0" signal    | -3 V DC ... 5 V DC  |
| Input voltage range "1" signal    | 11 V DC ... 30 V DC   |
| Nominal input voltage $U_{IN}$    | 24 V DC   |
| Nominal input current at $U_{IN}$ | 2.4 mA  |
| Current flow                      | linear until nominal current is reached, then constantly approx. 2.4 mA |
| Input filter time                 | 3000 $\mu$ s (Default)  |
|                                   | 1000 $\mu$ s  |
|                                   | < 100 $\mu$ s   |
| Process data update               | < 150 $\mu$ s   |
| Protective circuit                | Polarity reversal protection of the inputs; parallel diode (30 V, 5 s)  |

## Output data

Digital:

|   |  |
|---|--|
| Output name   | Digital outputs  |
| Connection method   | Push-in connection   |
| Connection technology   | 2-conductor  |
| Number of outputs   | 8  |
| Protective circuit  | Short-circuit protection, overload protection of the outputs; electronic   |
| Output voltage  | 24 V DC  |
| Limitation of the voltage induced on circuit interruption     | -25.8 V ... -15 V  |
| Max. current carrying capacity per output                     | max. 2 A   |
| Maximum output current per module                             | max. 16 A (Provide external protection; if the total current of 8 A is exceeded, connect the supply at the power connector parallel via both terminal points.) |
| Nominal output voltage  | 24 V DC  |
| Load min.   | 10 k $\Omega$  |
| Output voltage when switched off                              | max. 1 V   |
| Output current when switched off                              | max. 300 $\mu$ A   |
| Nominal load, inductive                                       | max. 48 VA (1.2 H, 12 $\Omega$ , at nominal load)  |
| Nominal load, lamp  | max. 48 W (at nominal voltage)   |
| Nominal load, ohmic   | max. 48 W (12 $\Omega$ , at nominal load)  |
| Switching frequency   | max. 3000 per second (with at least 50 mA load current)  |
|   | max. 1 per second (with inductive load)  |
|   | max. 4 per second (with nominal lamp load)   |
| Reverse voltage resistance to short pulses                    | limited protection up to 0.5 A for 1 s   |
| Behavior with overload  | Shutdown with automatic restart  |
| Behavior with inductive overload                              | Output can be destroyed  |
| Signal delay  | max. 150 $\mu$ s (when switched on)  |
|   | max. 150 $\mu$ s (when switched off, with at least 50 mA load current)   |
| Overcurrent shut-down   | as of 2.1 A  |
| Output current with ground connection interrupt when switched | < 1 mA   |

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off

## Product properties

|                   |   |
|-------------------|---|
| Product type      | I/O component                                       |
| Product family    | Axioline F  |
| Type              | block modular                                       |
| Mounting position | any (no temperature derating)                       |
| Scope of supply   | including bus base module and Axioline F connectors |

## Insulation characteristics

|                      |                              |
|----------------------|------------------------------|
| Overvoltage category | II (IEC 60664-1, EN 60664-1) |
| Pollution degree     | 2 (IEC 60664-1, EN 60664-1)  |

## Electrical properties

|   |        |
|---|--------|
| Maximum power dissipation for nominal condition | 7.95 W |
|---|--------|

### Potentials: Axioline F local bus supply ( $U_{BUS}$ )

|                |  |
|----------------|--|
| Supply voltage | 5 V DC (via bus base module)                         |
| Current draw   | max. 120 mA (up to HW 01)<br>max. 60 mA (from HW 02) |

### Potentials: Supply for digital input and output modules ( $U_{IO}$ )

|                      |  |
|----------------------|--|
| Supply voltage       | 24 V DC  |
| Supply voltage range | 19.2 V DC ... 30 V DC (including all tolerances, including ripple)   |
| Current draw         | max. 16 A (Provide external protection; if the total current of 8 A is exceeded, connect the supply at the power connector parallel via both terminal points.) |
| Current consumption  | typ. 10 mA (without connected peripherals)   |
| Protective circuit   | Surge protection; electronic (35 V, 0.5 s)<br>Reverse polarity protection; parallel diode; with external 5 A fuse (only for commissioning)                     |
| Protection           | max. 16 A (polarity reversal protection up to 5 A)   |

### Electrical isolation/isolation of the voltage ranges

|  |                        |
|--|------------------------|
| Test voltage: 5 V supply of the local bus ( $U_{BUS}$ ) / 24 V supply (I/Os) | 500 V AC, 50 Hz, 1 min |
| Test voltage: 5 V supply of the local bus ( $U_{BUS}$ ) / functional ground  | 500 V AC, 50 Hz, 1 min |
| Test voltage: 24 V supply (I/O) / functional ground                          | 500 V AC, 50 Hz, 1 min |

## Connection data

### Connection technology

|                               |   |
|-------------------------------|---|
| Connection name               | Axioline F connectors (digital inputs)  |
| Note on the connection method | Please observe the information provided on conductor cross-sections in the "Axioline F: system and installation" user manual. |

### Axioline F connectors (digital inputs)

|                   |                    |
|-------------------|--------------------|
| Connection method | Push-in connection |
|-------------------|--------------------|

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|                                   |   |
|-----------------------------------|---|
| Note on the connection method     | Please observe the information provided on conductor cross-sections in the "Axioline F: system and installation" user manual. |
| Conductor cross-section, rigid    | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>   |
| Conductor cross-section, flexible | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>   |
| Conductor cross-section AWG       | 24 ... 16   |
| Stripping length                  | 8 mm  |

## Axioline F connectors (supply and digital outputs)

|                                   |   |
|-----------------------------------|---|
| Connection method                 | Push-in connection  |
| Note on the connection method     | Please observe the information provided on conductor cross-sections in the "Axioline F: system and installation" user manual. |
| Conductor cross-section, rigid    | 0.5 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>   |
| Conductor cross-section, flexible | 0.5 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>   |
| Conductor cross-section AWG       | 20 ... 16   |
| Stripping length                  | 8 mm  |

## Environmental and real-life conditions

### Ambient conditions

|  |   |
|--|---|
| Ambient temperature (operation)          | -25 °C ... 60 °C                                  |
| Degree of protection                     | IP20  |
| Air pressure (operation)                 | 70 kPa ... 106 kPa (up to 3000 m above sea level) |
| Air pressure (storage/transport)         | 70 kPa ... 106 kPa (up to 3000 m above sea level) |
| Ambient temperature (storage/transport)  | -40 °C ... 85 °C                                  |
| Permissible humidity (operation)         | 5 % ... 95 % (non-condensing)                     |
| Permissible humidity (storage/transport) | 5 % ... 95 % (non-condensing)                     |

### Mechanical test

|  |     |
|--|-----|
| Vibration resistance in accordance with EN 60068-2-6/IEC 60068-2-6 | 5g  |
| Shock in accordance with EN 60068-2-27/IEC 60068-2-27              | 30g |
| Continuous shock in accordance with EN 60068-2-27/IEC 60068-2-27   | 10g |

## Standards and regulations

|                  |                                       |
|------------------|---------------------------------------|
| Protection class | III (IEC 61140, EN 61140, VDE 0140-1) |
|------------------|---------------------------------------|

## Mounting

|                   |                               |
|-------------------|-------------------------------|
| Mounting type     | DIN rail mounting             |
| Mounting position | any (no temperature derating) |

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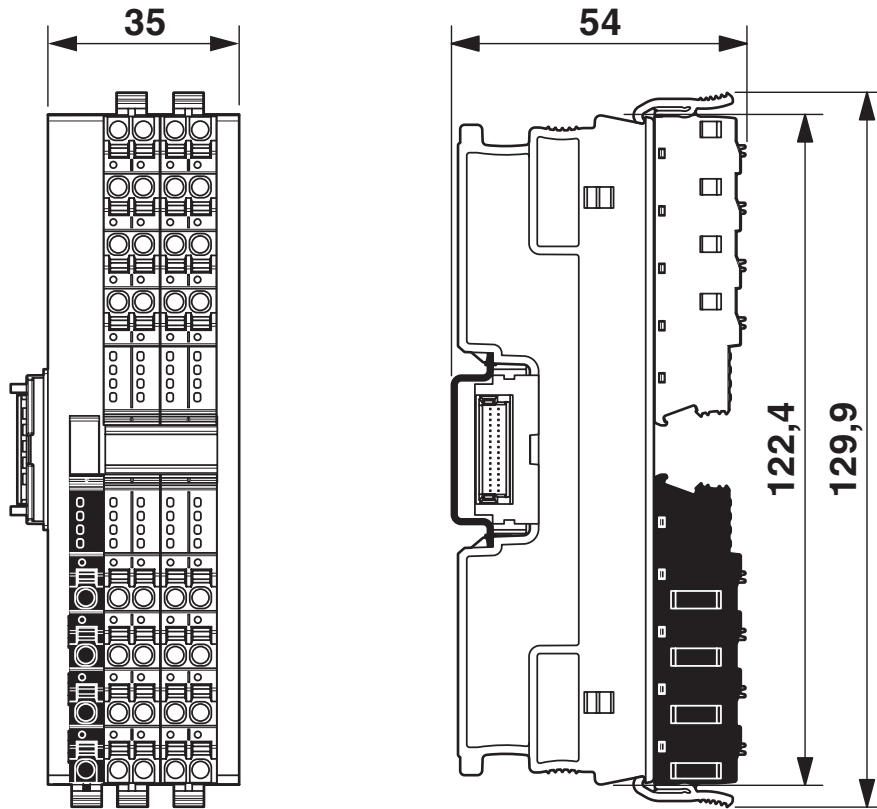


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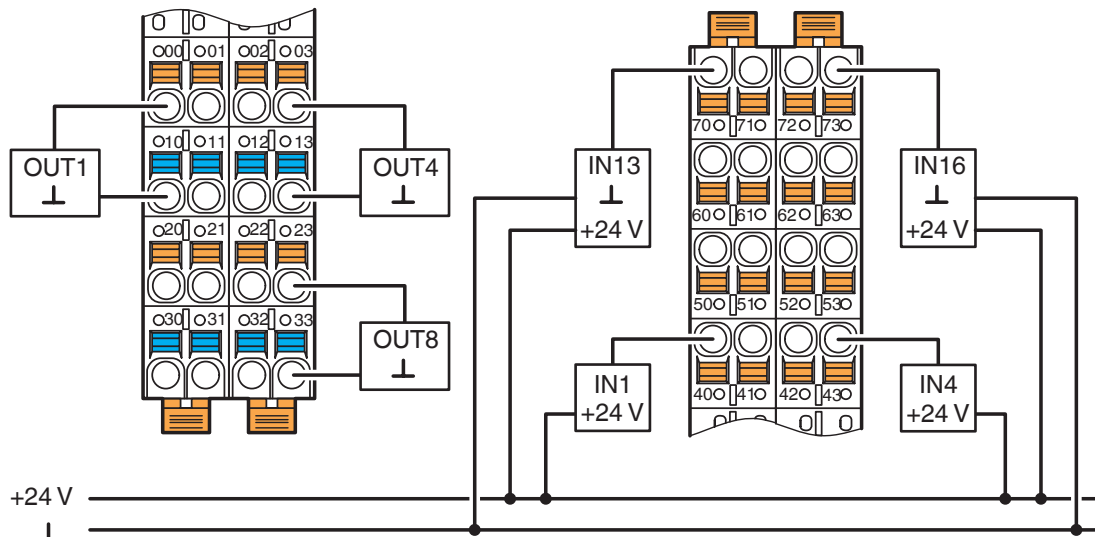
## Drawings

Dimensional drawing



Dimensions

Connection diagram



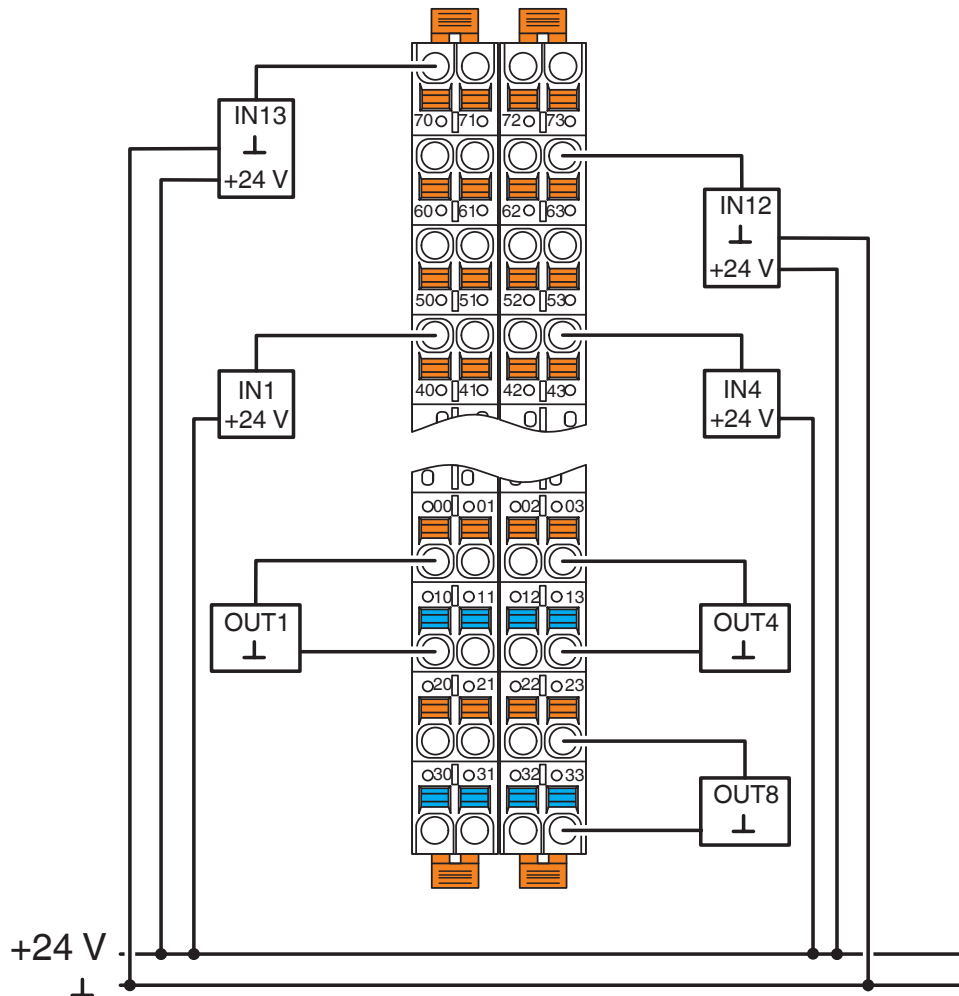
Connection example

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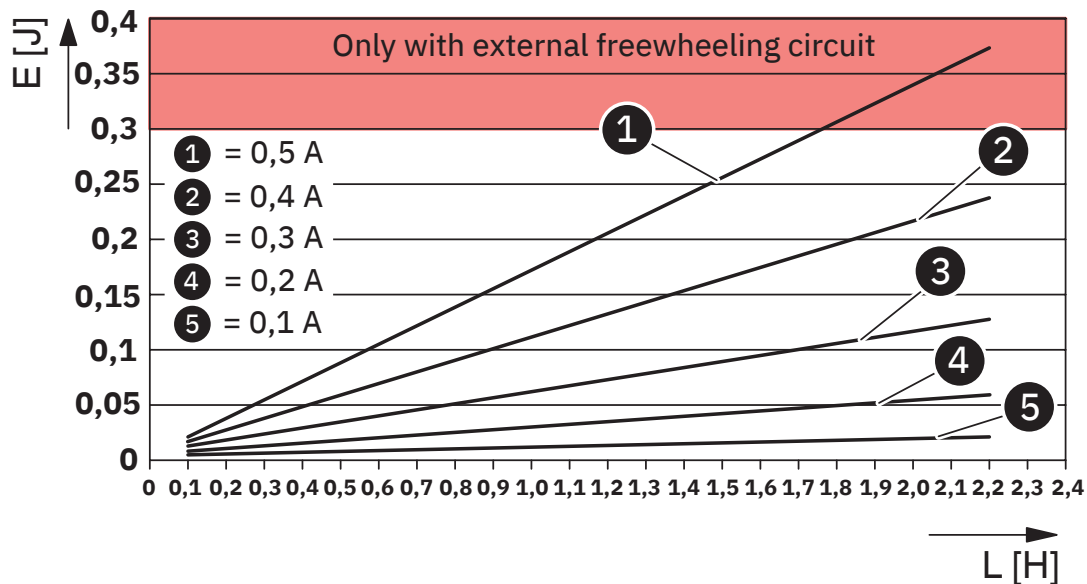
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Connection diagram



Example of connection of sensors and actuators

Diagram



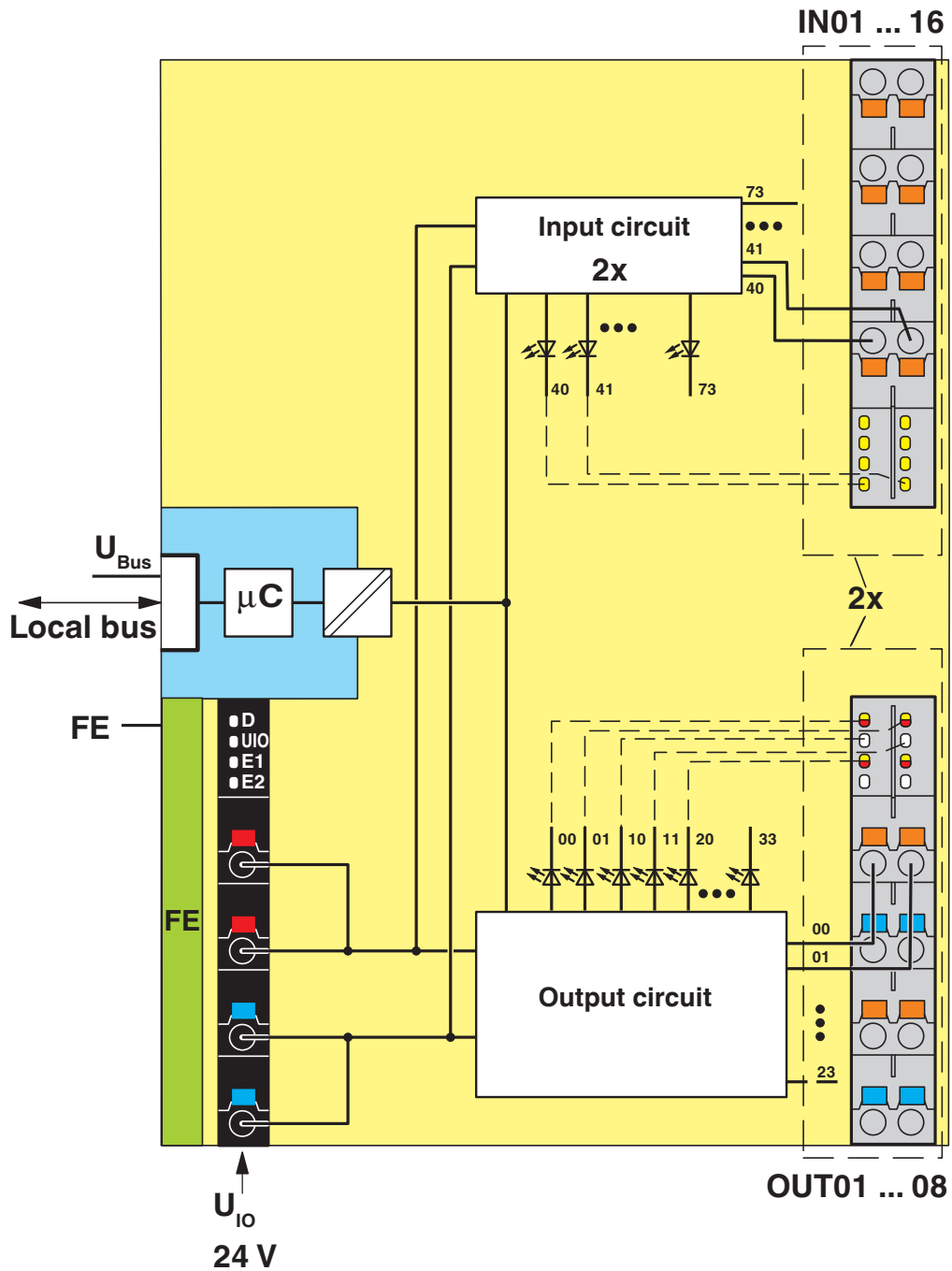
Maximum outputs power consumption when inductive loads are switched off

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Block diagram



Internal wiring of the terminal points

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## Approvals

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**cULus Listed**

Approval ID: E238705

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27242604 |
| ECLASS-15.0 | 27242604 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC001599 |
|-----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 32151600 |
|-------------|----------|

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## Environmental product compliance

### EU RoHS

|   |              |
|---|--------------|
| Fulfills EU RoHS substance requirements | Yes          |
| Exemption                               | 7(a), 7(c)-I |

### China RoHS

|  |   |
|--|---|
| Environment friendly use period (EFUP) | EFUP-50   |
|  | An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required. |

### EU REACH SVHC

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| REACH candidate substance (CAS No.) | Lead(CAS: 7439-92-1)                 |
| SCIP                                | e34c6e3f-b0ea-4932-8aae-7f82c1188017 |

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