

# Inverter power filters

## Technical Specifications, Installation Guide

UMI-S0xxx

### General Description

This guide provides basic installation information for the UMI-S0xxx series of input and output power filters intended for use with Unitronics series of inverters.



The UMI-S0xxx series of power filters offer high insertion loss and low leakage current. Proper filter selection, along with adequate installation and wiring, can help achieving compliance with IEC/EN 61800-3 emission levels for C2 or C3 environments for Unitronics inverter installations.

You may find additional documentation in the Technical Library in the Unitronics website:



<https://unitronicsplc.com/support-technical-library/>

### Alert Symbols and General Restrictions



When any of the following symbols appear, read the associated information carefully.

| Symbol   | Meaning | Description   |
|--|---------|---|
|  | Danger  | The identified danger causes physical and property damage.      |
|  | Warning | The identified danger could cause physical and property damage. |
| <i>Caution</i>   | Caution | Use caution.  |

- Before using this product, the user must read and understand this document.
- All examples and diagrams are intended to aid understanding, and do not guarantee operation. Unitronics accepts no responsibility for actual use of this product based on these examples.
- Please dispose of this product according to local and national standards and regulations.
- Only qualified service personnel should open this device or carry out repairs.

|  |   |
|--|---|
|  | ▪ Failure to comply with appropriate safety guidelines can cause severe injury or property damage.  |
|  | ▪ Do not attempt to use this device with parameters that exceed permissible levels.<br>▪ To avoid damaging the system, do not connect/disconnect the device when power is on. |

### Environmental Considerations

|  |  |
|--|--|
|  | ▪ Do not install in areas with: excessive or conductive dust, corrosive or flammable gas, moisture or rain, excessive heat, regular impact shocks or excessive vibration, in accordance with the standards given in the product's technical specification sheet. |
|  | ▪ Do not place in water or let water leak onto the unit.   |
|  | ▪ Do not allow debris to fall inside the unit during installation.   |
|  | ▪ Ventilation: 10mm space required between controller's top/bottom edges & enclosure walls.  |

### Electrical Specifications

| Filter    | Line Voltage | Current [A] | For inverter Side | IEC/EN 61800-3 Environment |
|-----------|--------------|-------------|-------------------|----------------------------|
| UMI-S0020 | 1Ph 220VAC   | 10          | Input             | C2                         |
| UMI-S0021 | 1Ph 220VAC   | 25          | Input             | C2                         |
| UMI-S0022 | 3Ph 380VAC   | 6           | Input             | C2                         |
| UMI-S0023 | 3Ph 380VAC   | 16          | Input             | C2                         |

| Filter    | Line Voltage | Current [A] | For inverter Side | IEC/EN 61800-3 Environment |
|-----------|--------------|-------------|-------------------|----------------------------|
| UMI-S0024 | 3Ph 380VAC   | 32          | Input             | C2                         |
| UMI-S0025 | 3Ph 380VAC   | 45          | Input             | C2                         |
| UMI-S0026 | 3Ph 380VAC   | 65          | Input             | C2                         |
| UMI-S0027 | 3Ph 380VAC   | 100         | Input             | C2                         |
| UMI-S0028 | 3Ph 380VAC   | 150         | Input             | C2                         |
| UMI-S0029 | 3Ph 380VAC   | 240         | Input             | C2                         |
| UMI-S0030 | 1Ph 220VAC   | 4           | Input             | C3                         |
| UMI-S0031 | 3Ph 380VAC   | 7           | Input             | C3                         |
| UMI-S0032 | 3Ph 380VAC   | 6           | Output            | C2                         |
| UMI-S0033 | 3Ph 380VAC   | 16          | Output            | C2                         |
| UMI-S0036 | 3Ph 380VAC   | 32          | Output            | C2                         |
| UMI-S0037 | 3Ph 380VAC   | 45          | Output            | C2                         |
| UMI-S0038 | 3Ph 380VAC   | 65          | Output            | C2                         |
| UMI-S0039 | 3Ph 380VAC   | 100         | Output            | C2                         |
| UMI-S0040 | 3Ph 380VAC   | 150         | Output            | C2                         |
| UMI-S0041 | 3Ph 380VAC   | 240         | Output            | C2                         |
| UMI-S0250 | 3Ph 380VAC   | 400         | Input             | C2                         |
| UMI-S0251 | 3Ph 380VAC   | 600         | Input             | C2                         |
| UMI-S0300 | 3Ph 380VAC   | 400         | Output            | C2                         |
| UMI-S0301 | 3Ph 380VAC   | 600         | Output            | C2                         |

## Filter Selection

The following table lists the suitable filters according to inverter model and IEC/EN 61800-3 environment:

| Inverter Model | IEC/EN 61800-3 environment |              |               |
|----------------|----------------------------|--------------|---------------|
|                | C3                         | C2           |               |
|                | Input Filter               | Input Filter | Output Filter |
| UMI-0004BE-B1  | UMI-S0030                  | UMI-S0020    | UMI-S0032     |
| UMI-0007BE-B1  | UMI-S0030                  | UMI-S0020    | UMI-S0032     |
| UMI-0015BE-B1  | UMI-S0030                  | UMI-S0021    | UMI-S0033     |
| UMI-0022BE-B1  | UMI-S0030                  | UMI-S0021    | UMI-S0033     |
| UMI-0007EE-B1  |                            | UMI-S0022    | UMI-S0032     |
| UMI-0015EE-B1  |                            | UMI-S0022    | UMI-S0032     |
| UMI-0022EE-B1  |                            | UMI-S0022    | UMI-S0032     |
| UMI-0040EE-B1  |                            | UMI-S0023    | UMI-S0033     |
| UMI-0055EE-B1  |                            | UMI-S0023    | UMI-S0033     |
| UMI-0075EE-B1  |                            | UMI-S0024    | UMI-S0036     |
| UMI-0110EE-B1  |                            | UMI-S0024    | UMI-S0036     |
| UMI-0150EE-B1  |                            | UMI-S0025    | UMI-S0037     |
| UMI-0185EE-B1  |                            | UMI-S0025    | UMI-S0037     |
| UMI-0220EE-B1  |                            | UMI-S0026    | UMI-S0038     |
| UMI-0300EE-B1  |                            | UMI-S0026    | UMI-S0038     |
| UMI-0370EE-B1  |                            | UMI-S0027    | UMI-S0039     |
| UMI-0450EE-B1  |                            | UMI-S0027    | UMI-S0039     |

| Inverter Model | IEC/EN 61800-3 environment |              |               |
|----------------|----------------------------|--------------|---------------|
|                | C3                         | C2           |               |
|                | Input Filter               | Input Filter | Output Filter |
| UMI-0550EE-B1  |                            | UMI-S0028    | UMI-S0040     |
| UMI-0750EE-B1  |                            | UMI-S0028    | UMI-S0040     |
| UMI-0900EE-B1  |                            | UMI-S0029    | UMI-S0041     |
| UMI-1100EE-B1  |                            | UMI-S0029    | UMI-S0041     |
| UMI-0004CE-B1  | UMI-S0031                  | UMI-S0022    | UMI-S0032     |
| UMI-0007CE-B1  | UMI-S0031                  | UMI-S0022    | UMI-S0032     |
| UMI-0015CE-B1  | UMI-S0031                  | UMI-S0023    | UMI-S0033     |
| UMI-0022CE-B1  | UMI-S0031                  | UMI-S0023    | UMI-S0033     |
| UMI-0040CE-B1  |                            | UMI-S0024    | UMI-S0036     |
| UMI-0055CE-B1  |                            | UMI-S0024    | UMI-S0036     |
| UMI-0075CE-B1  |                            | UMI-S0025    | UMI-S0037     |
| UMI-0004BU-B1  | UMI-S0030                  | UMI-S0020    | UMI-S0032     |
| UMI-0007BU-B1  | UMI-S0030                  | UMI-S0020    | UMI-S0032     |
| UMI-0015BU-B1  | UMI-S0030                  | UMI-S0021    | UMI-S0033     |
| UMI-0022BU-B1  | UMI-S0030                  | UMI-S0021    | UMI-S0033     |
| UMI-0004CU-B1  | UMI-S0031                  | UMI-S0022    | UMI-S0032     |
| UMI-0007CU-B1  | UMI-S0031                  | UMI-S0022    | UMI-S0032     |
| UMI-0007EU-B1  | UMI-S0031                  | UMI-S0022    | UMI-S0032     |
| UMI-0015EU-B1  | UMI-S0031                  | UMI-S0022    | UMI-S0032     |
| UMI-0022EU-B1  | UMI-S0031                  | UMI-S0023    | UMI-S0033     |
| UMI-0015EU-B5  |                            | UMI-S0022    | UMI-S0032     |
| UMI-0022EU-B5  |                            | UMI-S0022    | UMI-S0032     |
| UMI-0040EU-B5  |                            | UMI-S0023    | UMI-S0033     |
| UMI-0055EU-B5  |                            | UMI-S0023    | UMI-S0033     |
| UMI-0075EU-B5  |                            | UMI-S0024    | UMI-S0036     |
| UMI-0110EU-B5  |                            | UMI-S0024    | UMI-S0036     |
| UMI-0150EU-B5  |                            | UMI-S0025    | UMI-S0037     |
| UMI-0185EU-B5  |                            | UMI-S0025    | UMI-S0037     |
| UMI-0220EU-B5  |                            | UMI-S0026    | UMI-S0038     |
| UMI-0300EU-B5  |                            | UMI-S0026    | UMI-S0038     |
| UMI-0370EU-B5  |                            | UMI-S0027    | UMI-S0039     |
| UMI-0450EU-B5  |                            | UMI-S0027    | UMI-S0039     |
| UMI-0550EU-B5  |                            | UMI-S0028    | UMI-S0040     |
| UMI-0750EU-B5  |                            | UMI-S0028    | UMI-S0040     |
| UMI-0007CU-B5  |                            | UMI-S0022    | UMI-S0032     |
| UMI-0015CU-B5  |                            | UMI-S0023    | UMI-S0033     |
| UMI-0022CU-B5  |                            | UMI-S0023    | UMI-S0033     |
| UMI-0040CU-B5  |                            | UMI-S0024    | UMI-S0036     |
| UMI-0055CU-B5  |                            | UMI-S0024    | UMI-S0036     |
| UMI-0075CU-B5  |                            | UMI-S0025    | UMI-S0037     |
| UMI-0110CU-B5  |                            | UMI-S0026    | UMI-S0038     |
| UMI-0150CU-B5  |                            | UMI-S0026    | UMI-S0038     |
| UMI-0185CU-B5  |                            | UMI-S0027    | UMI-S0039     |
| UMI-0220CU-B5  |                            | UMI-S0027    | UMI-S0039     |
| UMI-0300CU-B5  |                            | UMI-S0028    | UMI-S0040     |
| UMI-0370CU-B5  |                            | UMI-S0028    | UMI-S0040     |

## Environmental

|                        |                                |
|------------------------|--------------------------------|
| Protection             | IP20                           |
| Operating temperature  | -10°C to 50°C (14°F to 122°F)  |
| Storage temperature    | -30°C to 70°C (-22°F to 158°F) |
| Relative Humidity (RH) | 5% to 90% (non-condensing)     |
| Operating Altitude     | Below 2,000 m (6,562 ft)       |
| Vibration              | ≤ 5.8m/s <sup>2</sup> (0.6g)   |

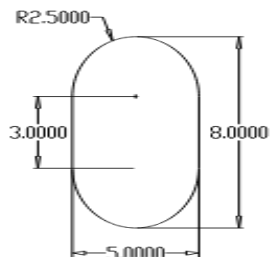
## Dimensions

| Part Number | L [mm] | L1 [mm] | L2 [mm] | W [mm] | W1 [mm] | H [mm] | Weight [kg] | Hole dim. | Ext. dim. | Wiring          |     |     |     |     |     |    |
|-------------|--------|---------|---------|--------|---------|--------|-------------|-----------|-----------|-----------------|-----|-----|-----|-----|-----|----|
| UMI-S0020   | 180    | 158     | 167     | 70     | 40      | 47     | 1.0         | a         | A         | Screw terminals |     |     |     |     |     |    |
| UMI-S0022   | 201    | 164     | 185     | 80     | 65      | 55     | 1.5         | b         |           |                 |     |     |     |     |     |    |
| UMI-S0032   | 233    | 196     | 216     | 87     | 65      | 61     | 2.5         |           |           |                 |     |     |     |     |     |    |
| UMI-S0023   |        |         |         |        |         |        |             |           |           |                 |     |     |     |     |     |    |
| UMI-S0033   |        |         |         |        |         |        |             |           |           |                 |     |     |     |     |     |    |
| UMI-S0024   | 222    | 185     | 204     | 105    | 76      | 94     | 3.5         | c         |           |                 |     |     |     |     |     |    |
| UMI-S0036   | 260    | 213     | 243     | 110    | 90      | 104    | 4.0         |           |           |                 |     |     |     |     |     |    |
| UMI-S0025   |        |         |         |        |         |        |             |           |           |                 |     |     |     |     |     |    |
| UMI-S0037   |        |         |         |        |         |        |             |           |           |                 |     |     |     |     |     |    |
| UMI-S0026   | 310    | 265     | 294     | 125    | 90      | 111    | 4.5         |           |           |                 |     |     |     |     |     |    |
| UMI-S0038   | 301    | 265     | 240     | 143    | 102     | 106    | 9.0         | d         | D         | Screw terminals |     |     |     |     |     |    |
| UMI-S0027   |        |         |         |        |         |        |             |           |           |                 |     |     |     |     |     |    |
| UMI-S0039   |        |         |         |        |         |        |             |           |           |                 |     |     |     |     |     |    |
| UMI-S0028   | 330    | 290     | 268     | 163    | 104     | 140    | 9.0         |           | C         | Copper bars     |     |     |     |     |     |    |
| UMI-S0040   | 483    | 386     | 286     | 220    | 200     | 126    | 11          |           |           |                 |     |     |     |     |     |    |
| UMI-S0029   |        |         |         |        |         |        |             | B         |           |                 |     |     |     |     |     |    |
| UMI-S0041   | 480    | 430     | 398     | 230    | 120     | 145    | 27          | e         | C         |                 |     |     |     |     |     |    |
| UMI-S0250   |        |         |         |        |         |        |             |           |           | 590             | 508 | 263 | 196 | 210 | 34  |    |
| UMI-S0300   |        |         |         |        |         |        |             |           |           | 480             | 430 | 398 | 263 | 196 | 210 | 32 |
| UMI-S0251   |        |         |         |        |         |        |             |           |           | 570             | 520 | 488 | 230 | 120 | 145 | 27 |
| UMI-S0301   |        |         |         |        |         |        |             |           |           | 480             | 430 | 398 | 230 | 120 | 145 | 22 |

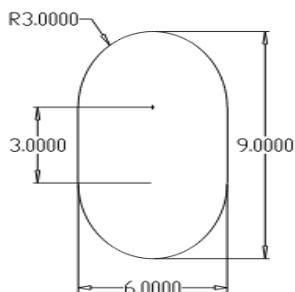
Note that figures are for illustrative purposes only.

### Hole Dimensions

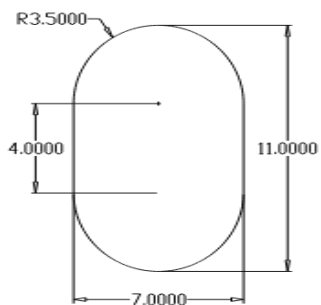
**Figure a**



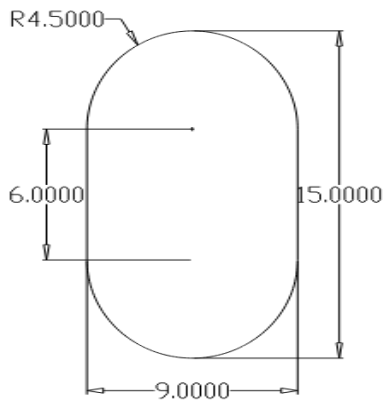
**Figure b**



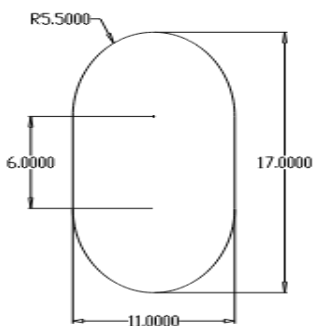
**Figure c**



**Figure d**

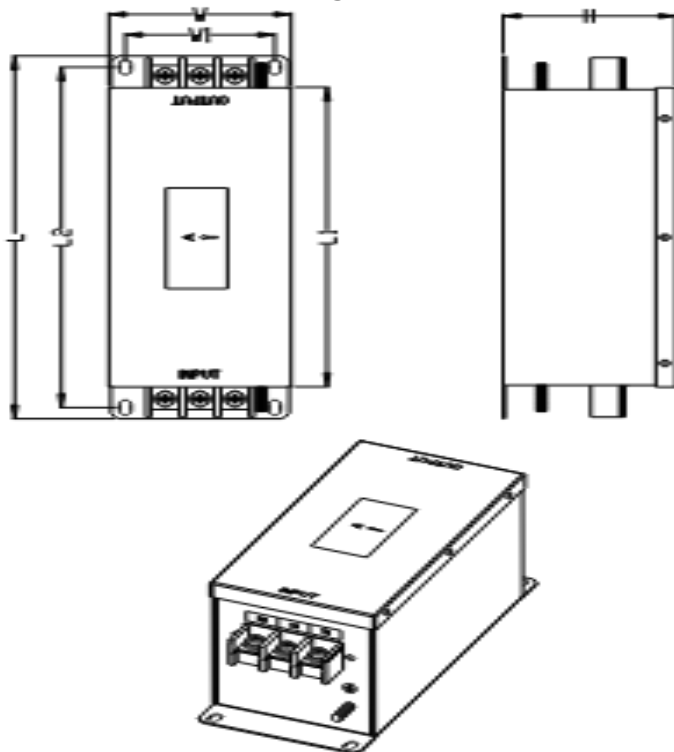


**Figure e**



**External Dimensions**

**Figure A**



**Figure B**

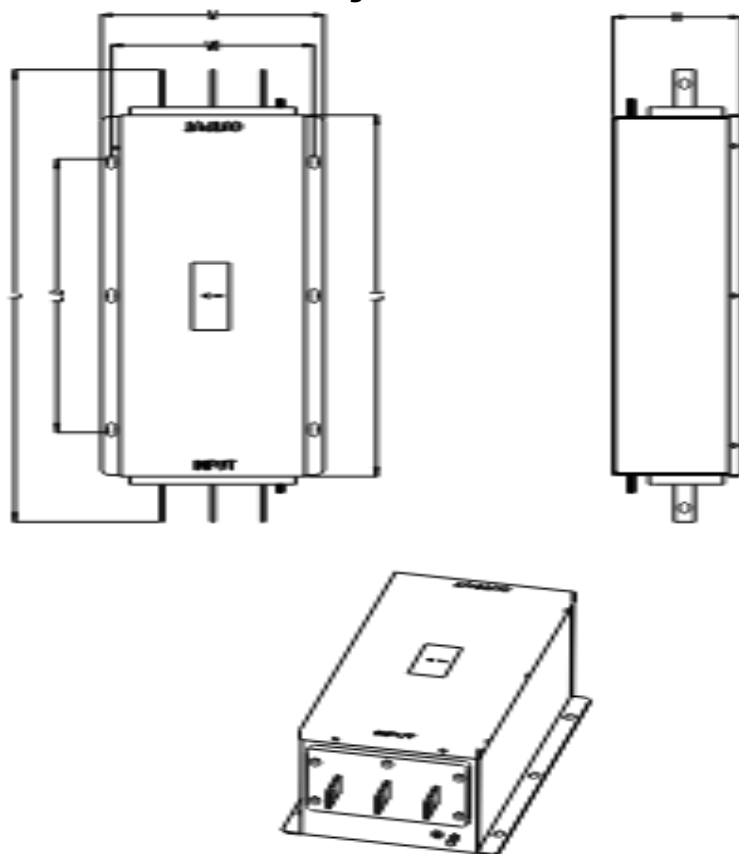
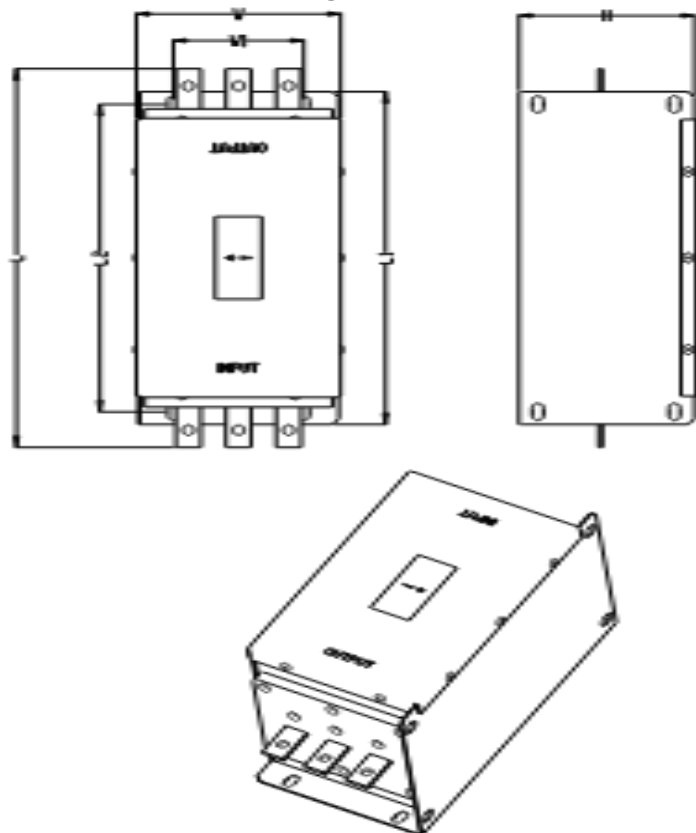
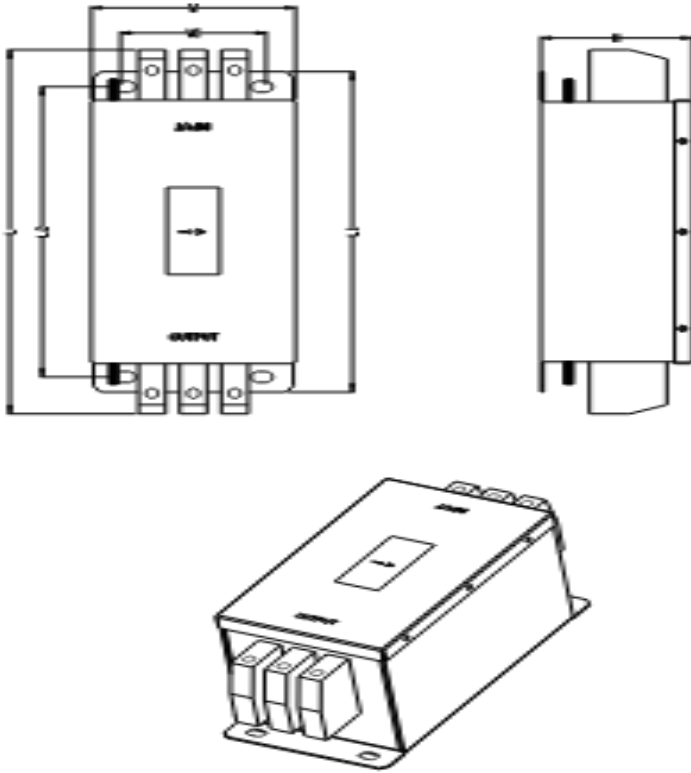


Figure C





**Figure D**



## Installation and Wiring



- Do not install in areas with: excessive or conductive dust, corrosive or flammable gas, moisture or rain, excessive heat, regular impact shocks or excessive vibration, in accordance with the standards given in the product's technical specification sheet.
- Do not place in water or let water leak onto the unit.



- Ventilation: 10mm space required between controller's top/bottom edges & enclosure walls.



- Do not touch live wires.
- All wiring activities should be performed while power is OFF.
- Use over-current protection, such as a fuse or circuit breaker, to avoid excessive currents into the unit.
- Use wires that are properly sized for the load.
- Double-check all wiring before turning on the power to the system.



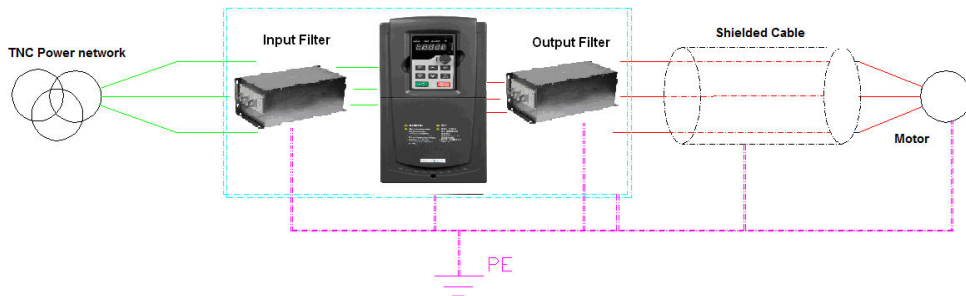
- The filter is recommended to be used in TNC system.

### Caution

- The input filter cannot be used as an output filter, and vice versa.
- The input and output ports of the filter cannot be reversed.
- Ensure secure connection of cables to their wiring terminals.

In order to ensure best EMI performance:

- Use a metal cabinet. Make sure the cabinet and its doors are properly earthed.
- The metal enclosure of the input filter and the enclosure of the inverter need to be tightly-grounded.
- The wiring cable of the filter needs to be short and thick enough.
- Input and output cabling of the filter cannot be routed with overlap.
- The input and output cable of the filter cannot be routed in parallel with the control cables.
- Use shielded twisted-pair cables for inverter control signals.
- Use shielded cable for the motor.
- The input filter needs to be installed to the inlet of the metal chassis, but the output filter needs to be installed to the outlet of the metal chassis.



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