

RFI Filter Units for Frequency Inverters FR-S 500 EC/ECR

Short reference for RFI filter unit types FR-S5NFSA-0.75 k to FR-S5NFSA-1.5 k, FR-S5NFSB-0.75 k to FR-S5NFSB-1.5 k, FFR-S540-8A-RF100, and FFR-S540-13A-RF100

Please read the following installation notes carefully to ensure a proper usage.



CAUTION:

The RFI filter units described in this short reference are designed for exclusive use in combination with the Mitsubishi inverter type FR-S 500. Their function is to reduce mains conducted RFI noise to comply with the EN 55011 A / EN 55022 B domestic standards. Practical results may differ from this. Please note, that the appearance and wiring layout of the noise filters may differ from the figures shown in this short reference. Safe functioning as well as the grade of the radio frequency protection are not affected by this.

For further details please refer to the Mitsubishi manual for Frequency Inverters and EMC, which contains detailed information about EMC conforming installation.

Mounting

Check the inverter type. The filter should be used only in combination with inverters described in the table below.

| Frequency-inverter | Filter | Class A | | Class B | | | |
|--------------------|--------------|------------------|-----|---------|------|-----|---|
| | | 100 m | 5 m | 30 m | 20 m | 1 m | |
| FR-S 520S EC/ECR | 0.2 k–0.75 k | FR-S5NFSA-0.75 k | | ● | | | ● |
| | | FR-S5NFSB-0.75 k | ● | | ● | | |
| | 1.5 k | FR-S5NFSA-1.5 k | | ● | | | ● |
| | | FR-S5NFSB-1.5 k | ● | | ● | | |
| FR-S 540 EC/ECR | 0.4 k–1.5 k | ● | | | ● | | |
| | 2.2 k–3.7 k | ● | | | ● | | |

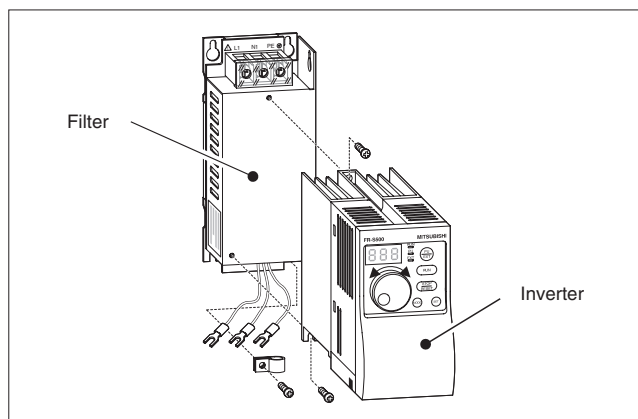
Function

The RFI units described in this short reference are designed to reduce mains conducted RFI emissions to meet the European standards EN 55011 A / EN 55022 B. Practical results may differ from this.

Mounting on rear panel of inverter

Place the inverter on the top side of the filter and secure it firmly with the provided screws.

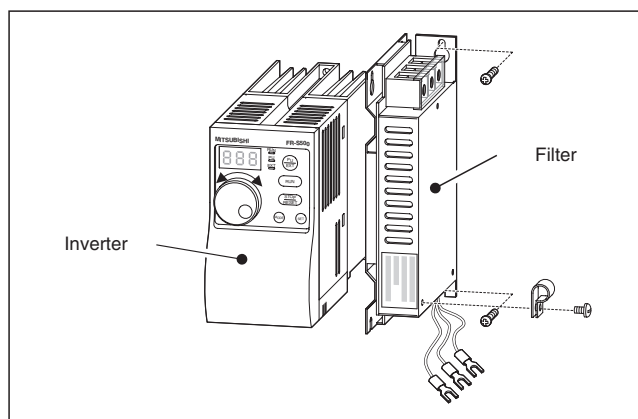
Fix the filter-inverter unit on the back of the cabinet. For correct filter performance the filter mounting bolts should electrically bond to the cabinet back panel which is connected to earth. Usually this is achieved by screwing the filter and the inverter to the back of the cabinet. If required, the paint should be removed from the cabinet in the according places.



Mounting side-by-side with inverter

For the side-by-side mounting the filter and the respective inverter are mounted on the back of the cabinet one beside the other. Use the provided mounting screws for fixing the filter.

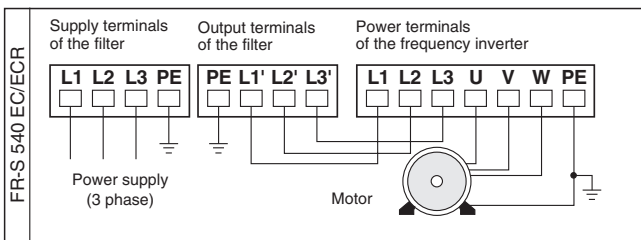
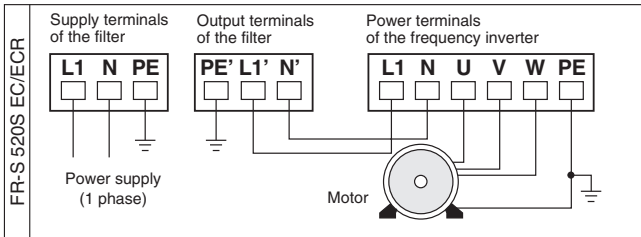
For correct filter performance the housings of the filter and the inverter must electrically bond to the cabinet back panel which is connected to earth. Usually this is achieved by screwing the filter and the inverter to the back of the cabinet. If required, the paint should be removed from the cabinet in the according places.



Wiring

For electrical installation follow the wiring procedure shown in the picture below. The maximum wiring length of the motor cable must be within the specified values.

The connection of the inverters FR-S 520S EC/ECR is single-phase, the connection of the inverters FR-S 540 EC/ECR is three-phase.



All cables especially the line between inverter and motor must be shielded to reduce cable radiation. The shield of the motor line must be connected on both sides motor and filter. Earth motor and filter.

The outputs of the filters are equipped with coloured wires. The combination of the wires and the inverter terminals is listed in the following table.

| Filter | Filter side | Inverter side |
|-------------------|--------------|---------------|
| FR-S5NFSA-□ k | black | L1 |
| | blue | N |
| | yellow/green | PE |
| FR-S5NFSA-□ k | black | L1 |
| | blue | N |
| | yellow/green | PE |
| FFR-S540-□A-RF100 | black | L1, L2, L3 |
| | yellow/green | PE |

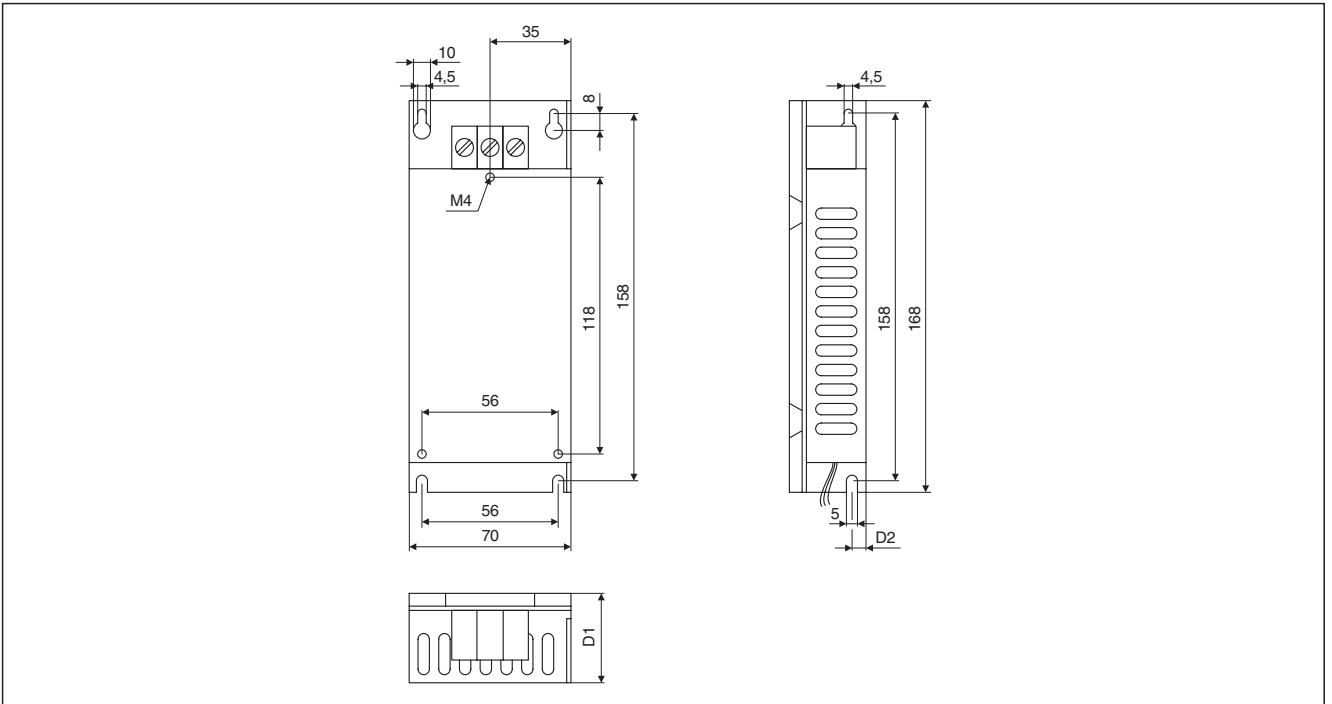
For environmental conditions and mounting position please note the instructions in the operation manual for the frequency inverter FR-S 500 EC/ECR.

Specifications

| Specifications | Filter | | |
|---------------------------|------------------------------|---------------|-------------------|
| | FR-S5NFSA-□ k | FR-S5NFSA-□ k | FFR-S540-□A-RF100 |
| Rated voltage | 1~ 200-240 V (+10 % / -15 %) | | 3~ 480 V AC |
| Frequency | 50 / 60 Hz | | |
| Rated and leakage current | see the following tables | | |
| Power loss | see the following tables | | |
| Ambient temperature range | -10-50 °C | | -25-65 °C |
| Ambient humidity | 90 % (no condensation) | | |
| Vibration resistance | 5-200 Hz; 1.2 G | | |

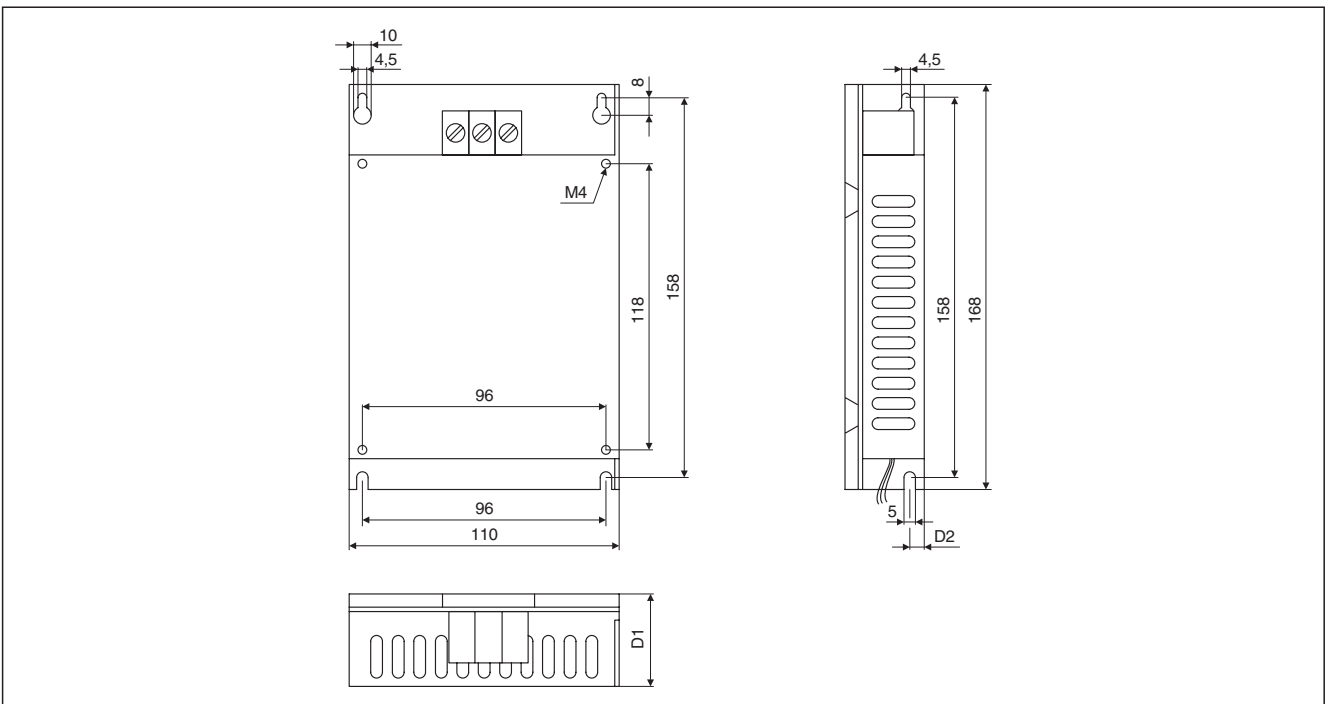
Dimensions

Filter types FR-S5NFSA-0.75 k and FR-S5NFSB-0.75 k

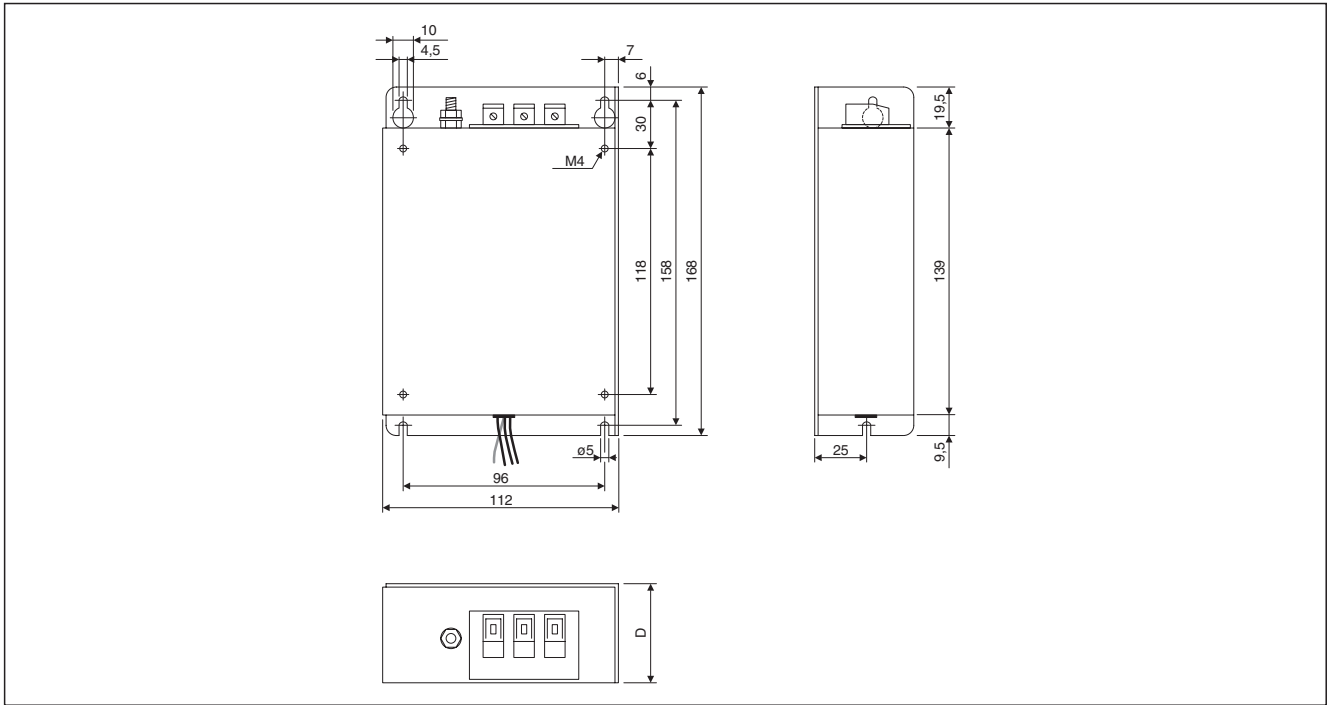


| Filter type | Frequency inverter | D1 | D2 | Mounting screws | Weight [kg] | Power loss [W] | Leakage current [mA] | Rated current [A] |
|------------------|--------------------------------|----|-----|-----------------|-------------|----------------|----------------------|-------------------|
| FR-S5NFSA-0.75 k | FR-S 520 S-0.2 k-0.75 k EC/ECR | 35 | 9.5 | 4 × M4 | 0.7 | 1.74 | 4.5 | 14 |
| FR-S5NFSB-0.75 k | | 47 | 11 | 4 × M4 | 0.9 | 6.75 | 9.5 | 14 |

Filter types FR-S5NFSA-1.5 k and FR-S5NFSB-1.5 k



| Filter type | Frequency inverter | D1 | D2 | Mounting screws | Weight [kg] | Power loss [W] | Leakage current [mA] | Rated current [A] |
|-----------------|-------------------------|----|-----|-----------------|-------------|----------------|----------------------|-------------------|
| FR-S5NFSA-1.5 k | FR-S 520 S-1.5 k EC/ECR | 35 | 9.5 | 5 × M4 | 0.8 | 8.55 | 9.5 | 25 |
| FR-S5NFSB-1.5 k | | 47 | 11 | 5 × M4 | 1.3 | 9.25 | 14 | 20 |

Filter types FFR-S540-8A-RF100 and FFR-S540-13A-RF100


| Filter type | Frequency inverter | D | Mounting screws | Weight [kg] | Power loss [W] | Leakage current [mA] | Rated current [A] |
|--------------------|---------------------------|----|-----------------|-------------|----------------|----------------------|-------------------|
| FFR-S540-8A-RF100 | FR-S 540-0.4-1.5 k EC/ECR | 40 | 4 × M4 | 0.8 | 5.1 | < 10 | 8 |
| FFR-S540-13A-RF100 | FR-S 540-2.2-3.7 k EC/ECR | 45 | 4 × M4 | 0.9 | 7.1 | < 10 | 13 |

Specifications subject to change without prior notice.

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