

RFI Filter Units for Frequency Inverters FR-E 500 EC

Short reference for RFI filter unit type FFR-E540-4,5A-SF1 to 27A-SF1, FFR-E520S-14A-SF1 to 34A-SF1, FR-E5NF-H 0,75 k to H 7,5 k and FR-E5NFS-0,75 k to 2,2 k

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-E 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 (100 m)	Class B (20 m)	Class A (5 m)	
FR-E 520S EC	0.4 k / 0.75 k	FFR-E520S-14A-SF1	●	●	
		FR-E5NFS-0.75 k			●
	1.5 k / 2.2 k	FFR-E520S-34A-SF1	●	●	
		FR-E5NFS-2.2 k			●
FR-E 540 EC	0.4 k / 0.75 k	FFR-E540-4.5A-SF1	●	●	
		FR-E5NF-H 0.75 k			●
	1.5 k-3.7 k	FFR-E540-15A-SF1	●	●	
		FR-E5NF-H 3.7 k			●
	5.5 k / 7.5 k	FFR-E540-27A-SF1	●	●	
		FR-E5NF-H 7.5 k			●

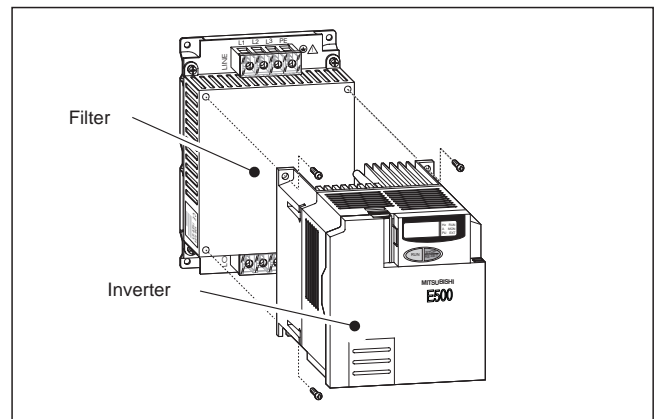
Function

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. Therefore the filters FR-E5NF and FR-E5NFS meet the standards EN 55011 A with a motor cable length of 5 m.

The filters FFR-E540 and FFR-E520S meet the standards EN 55011 A with a motor cable length of 100 m and the standard EN 55022 B with a motor cable length of 20 m.

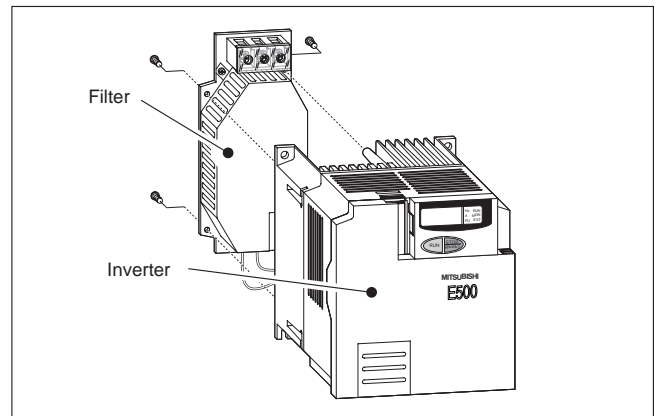
Mounting of footprint filters

Fix the inverter to the top panel of the filter and secure it with the screws provided.



Mounting of built-on filters

The filters FR-E5NFS-0.75 k and FR-E5NFS-2.2 k are flush fitting filters. Set the filter in the spacing of the inverter and secure it with the screws provided.



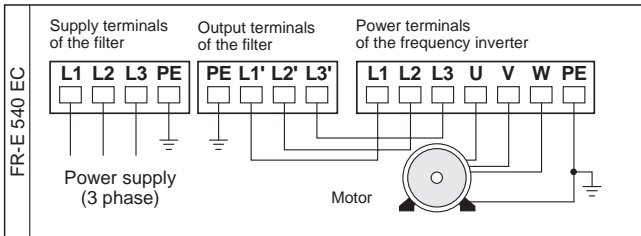
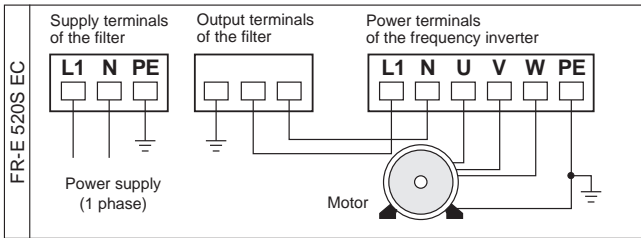
Installation in a cabinet

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. If this is not possible, the paint should be removed from the cabinet directly under the filter footprint.

Wiring

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

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



All cables must be shielded and earthed at both ends in order to reduce cable radiation. Earth motor, bond to filters.

The outputs of the filters FFR-E520S-14A-SF1 to FFR-E520S-34A-SF1, FR-E5NFS-0,75 k to FR-E5NFS-2,2 k and FFR-E540-4,5A-SF1 to FFR-E540-27A-SF1 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
FFR-E520S-□A-SF1	black	L1, N
	yellow/green	PE
FR-E5NFS-□ k	black	L1
	blue	N
FFR-E540-□A-SF1	black	L1, L2, L3
	yellow/green	PE

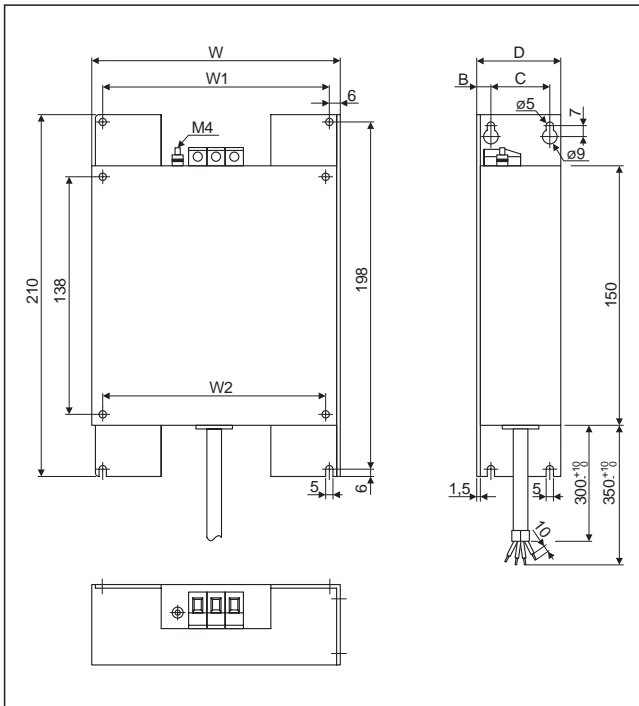
For environmental conditions and mounting position please note the instructions in the operation manual for the frequency inverter FR-E 500 EC.

Specifications

Specifications	Filter			
	FFR-E520S-□A-SF1	FR-E5NFS-□ k	FFR-E540-□A-SF1	FR-E5NF-H □ k
Rated voltage	max. 1~ 250 V AC		max. 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	-25~85 °C	-10~50 °C	-25~85 °C	-10~50 °C
Ambient humidity	90 %			
Vibration	10~200 Hz; 1.8 G	5~200 Hz; 1.2 G	10~200 Hz; 1.8 G	5~200 Hz; 1.2 G

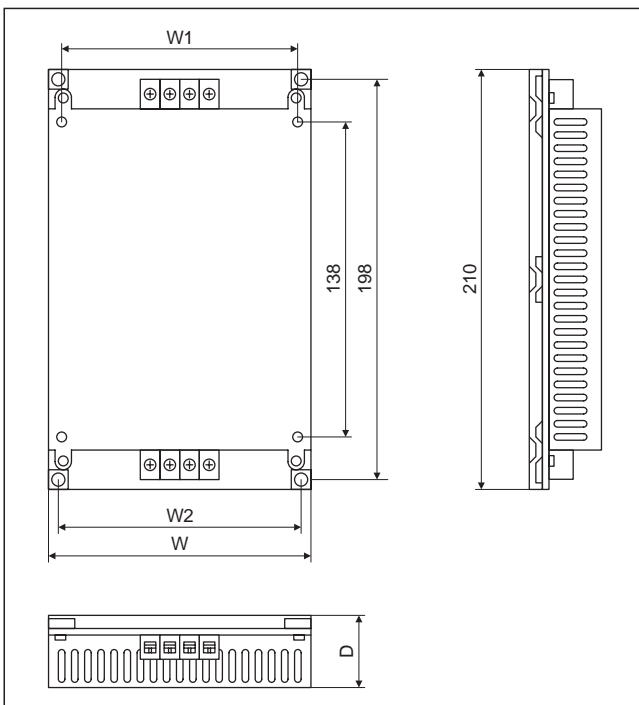
Dimensions

Filter type FFR-E520S-14A-SF1 to FFR-E520S-34A-SF1 and FFR-E540-4,5A-SF1 to FFR-E540-27A-SF1

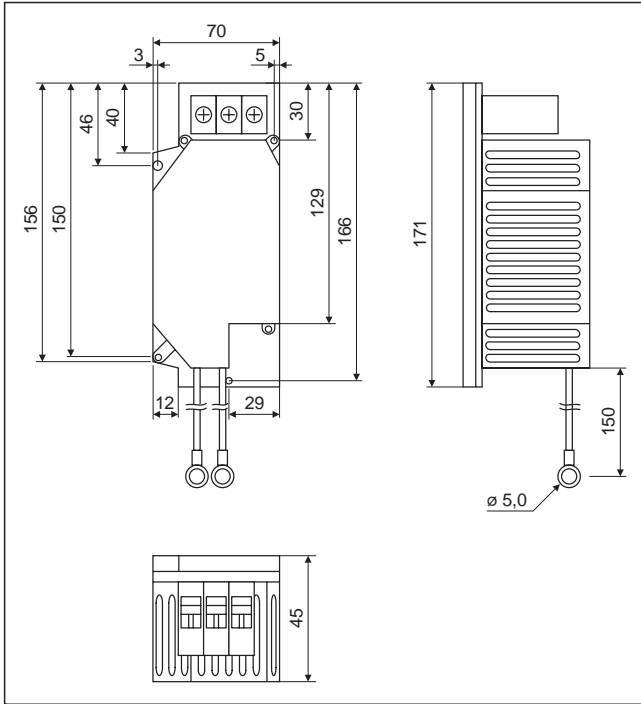


Inverter	FR-E 520S EC		FR-E 540 EC		
	0.4 k/0.75 k	1.5 k/2.2 k	0.4 k/0.75 k	1.5 k-3.7 k	5.5 k/7.5 k
Filter type	FFR-E520S		FFR-E540		
	14A-SF1	34A-SF1	4.5A-SF1	15A-SF1	27A-SF1
W	140	140	140	140	220
B	8	12.5	8	8	12.5
C	30	30	30	30	30
D	46	55	46	46	55
W1, W2	128	128	128	128	208
Mounting screws	4 x M4	4 x M4	4 x M4	4 x M4	4 x M4
Weight [kg]	1.3	1.3	1.3	1.45	1.7
Power loss [W]	11	17	4	12	25
Leakage current [mA]	< 30	< 30	< 30	< 30	< 30
Rated current [A]	14	34	4.5	15	27

Filter type FR-E5NF-H 0,75 k to FR-E5NF-H 7,5 k



Inverter	FR-E 540 EC		
	0.4 k/0.75 k	1.5 k-3.7 k	5.5 k/7.5 k
Filter type	FR-E5NF		
	H 0.75 k	H 3.7 k	H 7.5 k
W	140	140	220
D	46	46	47
W1, W2	128	128	208
Mounting screws	4 x M4	4 x M4	4 x M4
Weight [kg]	1.1	1.2	2
Power loss [W]	5.5	8	15
Leakage current [mA]	< 30	< 30	< 30
Rated current [A]	4.5	15	27

Filter type FR-E5NFS-0,75 k to FR-E5NFS-2,2 k


Inverter	FR-E 520S EC	
	0.4 k/0.75 k	1.5 k-2.2 k
Filter type	FR-E5NFS	
	0.75 k	2.2 k
Mounting screws	4 x M4	4 x M4
Weight [kg]	0.5	0.6
Power loss [W]	5	7.5
Leakage current [mA]	< 30	< 30
Rated current [A]	14	34