

# RFI Filter Units for Frequency Inverters FR-V 500

Short reference for RFI filter unit type FFR-A540-8A-SF100 to 180A-SF100 and FN 3359/180/28 to FN 3359/1000/99

Please read the following installation notes carefully to use the filter unit to its option.



**CAUTION:**

*The RFI filter units described in this reference sheet are designed exclusively for use with Mitsubishi inverter type FR-V 500. These filters are necessary to comply with limits for conducted noise voltages defined by the EN 61800-3 standard. The ≤ 180 A filter units are suitable for complying with the limits for Environment 1 (unrestricted and restricted distribution) and Environment 2. The > 180 A filter units are suitable for complying with the limits for Environment 1 (restricted distribution) and Environment 2. It is possible to that you may experience different results in practice, particularly if you do not completely and correctly follow the accepted EMC procedures for proper installation of filters and routing the power and control lines.*

*These filters are NOT designed for use in IT networks. When the noise filters are operated leakage currents are discharged to earth. This can trigger upstream protective devices, particularly when there are unbalanced mains voltages or mains phase failures. Please note, that the appearance and wiring mechanics 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 do not take affect of 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
FR-V 540	1.5 k	FFR-A540-8A-SF100
	2.2 k	FFR-A540-16A-SF100
	3.7 k/5.5 k	FFR-A540-30A-SF100
	7.5 k–15 k	FFR-A540-50A-SF100
	18.5 k	FFR-A540-75A-SF100
	22 k	FFR-A540-95A-SF100
	30 k/37 k	FFR-A540-120A-SF100
	45 k/55 k	FFR-A540-180A-SF100 ① FN 3359/180/28
FR-V 540L	75 k	FN 3359/180/28
	90 k	FN 3359/250/28
	110 k–132 k	FN 3359/400/99
	160 k/200 k	FN 3359/600/99
	250 k	FN 3359/600/99

① Attention, no footprint mounting possible

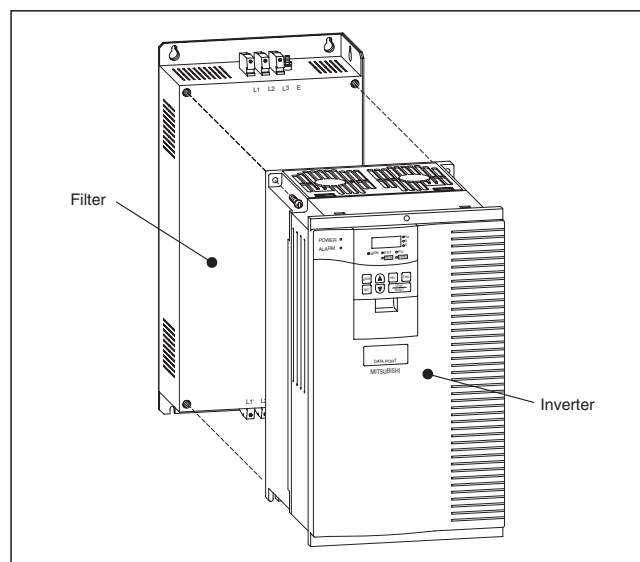
## Function

The filters described in this document are designed to reduce conducted noise voltages to comply with the limits defined for Environments 1 and 2. The FFR-A540-□□□A-SF100 can provide conformity with the limits for Environment 1 (unrestricted distribution) with motor cable lengths of up to 20 m (shielded) and for Environment 1 (restricted distribution) with motor cable lengths of up to 100 m (shielded), and thus also with the 100 A limits of Environment 2 with motor cable lengths of up to 100 m.

The FN 3359/□□□ filters can provide conformity with the limits for Environment 1 (restricted distribution) with motor cable lengths of up to 100 m (shielded), and thus also with the limits defined for Environment 2 up to the same motor cable length.

## Mounting of filters type FFR-A540-□□□A

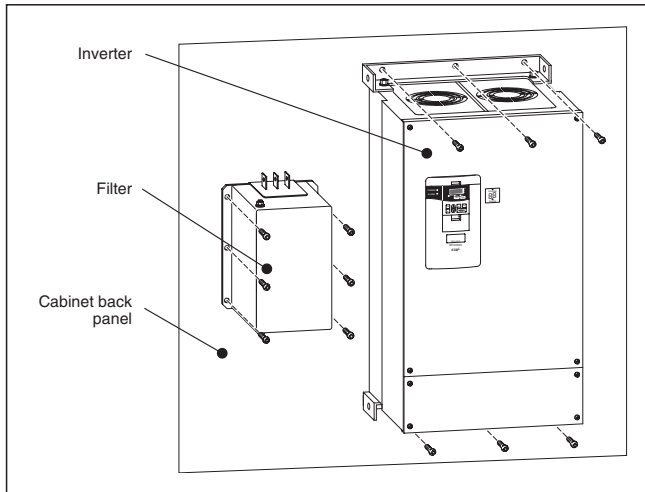
Fix the inverter to the top panel of the filter and secure it with the screws provided.



To fix the filter-inverter unit on the back of the cabinet use the mounting bolts provided with the filter. 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.

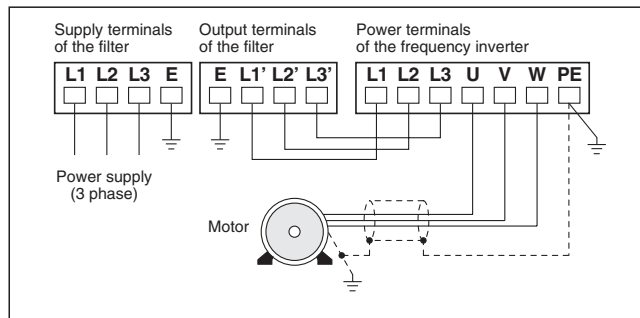
### Mounting of filters type FN 3359/□□□

The filters type FN3359 and the according inverters are mounted side by side 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.



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 the motor and inverter side. Earth motor and filter.

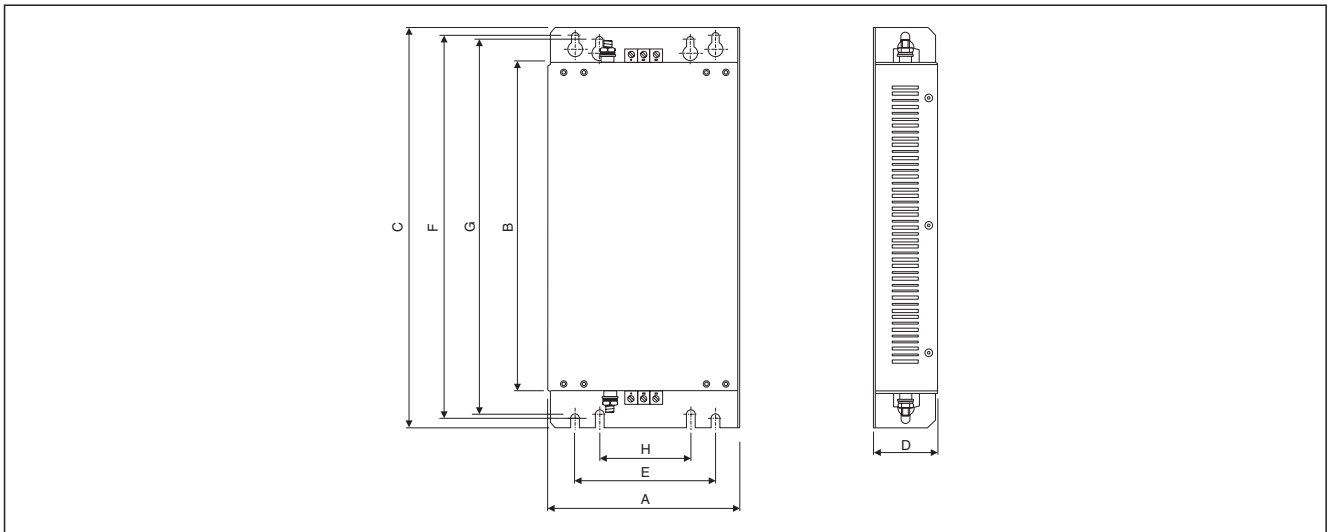
For environmental conditions and mounting position please note the instructions in the operation manual for the frequency inverter FR-V 500.

### Specifications

Specifications	Filter	
	FFR-A540-□□□A-SF100	FN 3359/□□□
Rated voltage	Max. 3~ 480 V AC	Max. 3~ 500 V AC
Frequency	50 / 60 Hz	50 / 60 Hz
Rated and leakage current	See the following tables	See the following tables
Power loss	See the following tables	See the following tables
Ambient temperature range	-25~85 °C	-25~85 °C
Ambient humidity	90 %	90 %
Vibration	10~200 Hz; 1.8 g	10~200 Hz; 1.8 g

## Dimensions

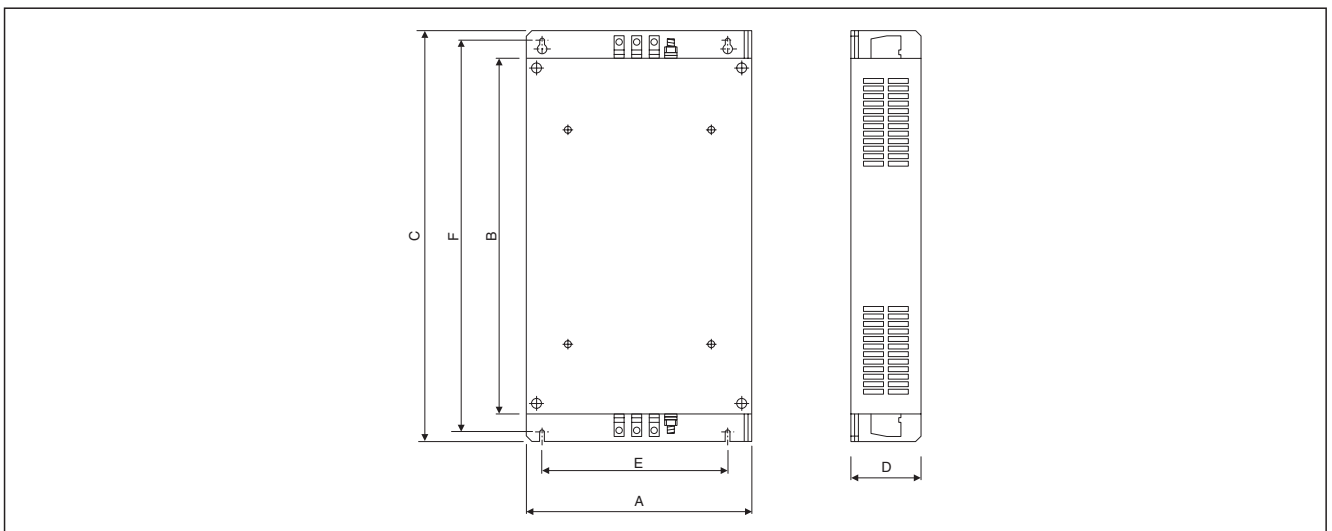
### Filter type FFR-A540-8A-SF100 to FFR-A540-30A-SF100



Filter type	Inverter	A	B	C	D	E	F	G	H	Mounting screws	Weight [kg]	Power loss [W]	Leakage current <sup>①</sup> [mA]	Rated current [A]
FFR-A540-8A-SF100	FR-V 540-1.5 k	150	260	315	50	110	300	295	70	4 × M5	1.5	5	< 30	8
FFR-A540-16A-SF100	FR-V 540-2.2 k	150	260	315	50	110	300	295	70	4 × M5	1.5	8	< 30	16
FFR-A540-30A-SF100	FR-V 540-3.7/5.5 k	220	260	315	60	180	300	295	125	4 × M5	1.8	14	< 30	30

<sup>①</sup> The values shown are for the leakage currents in a balanced 400 V 50 Hz mains network under normal conditions. Higher leakage currents can occur briefly in the event of phase failures and when systems are powered on.

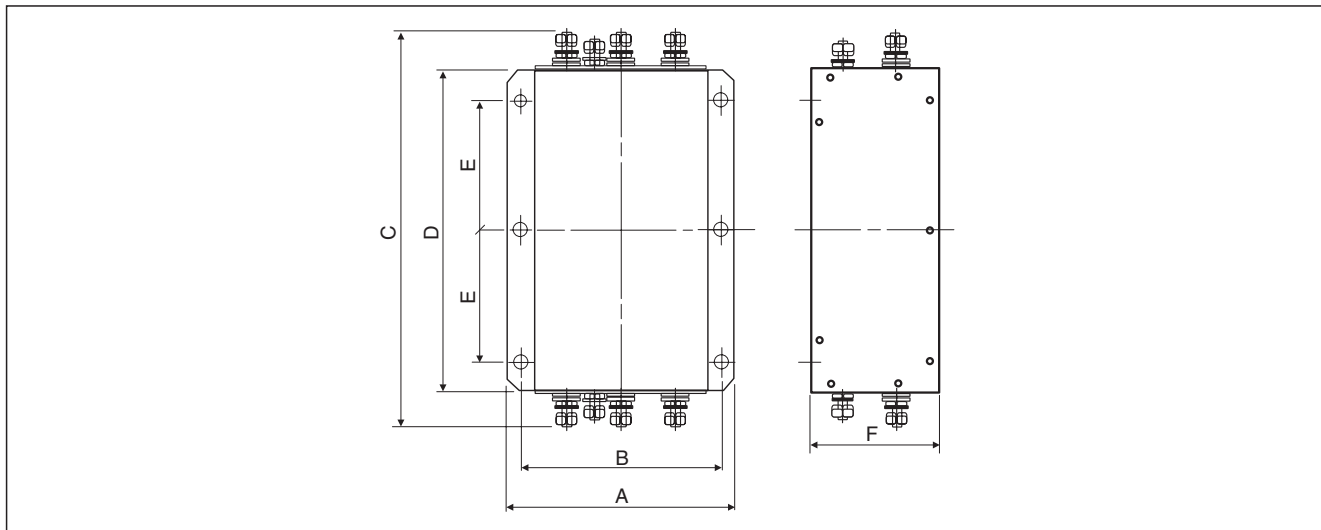
### Filter type FFR-A540-50A-SF100 to FFR-A540-180A-SF100



Filter type	Inverter	A	B	C	D	E	F	Mounting screws	Weight [kg]	Power loss [W]	Leakage current <sup>①</sup> [mA]	Rated current [A]
FFR-A540-50A-SF100	FR-V 540-7.5 k-15 k	251.5	400	460	80	210	445	4 × M8 (for FR-A540) 4 × M5 (for FR-A520)	3.5	25	< 30	50
FFR-A540-75A-SF100	FR-V 540-18.5 k	251.5	400	476	80	210	457	4 × M8 (for FR-A540) 4 × M5 (for FR-A520)	4.1	34	< 30	75
FFR-A540-95A-SF100	FR-V 540-22 k	340	550	626	90	280	607	4 × M8	6.7	36	< 30	95
FFR-A540-120A-SF100	FR-V 540-30 k/37 k	450	550	636	120	380	617	4 × M10	9.7	34	< 30	120
FFR-A540-180A-SF100	FR-V 540-45 k/55 k	450	550	652	120	380	633	4 × M10	10.8	62	< 30	180

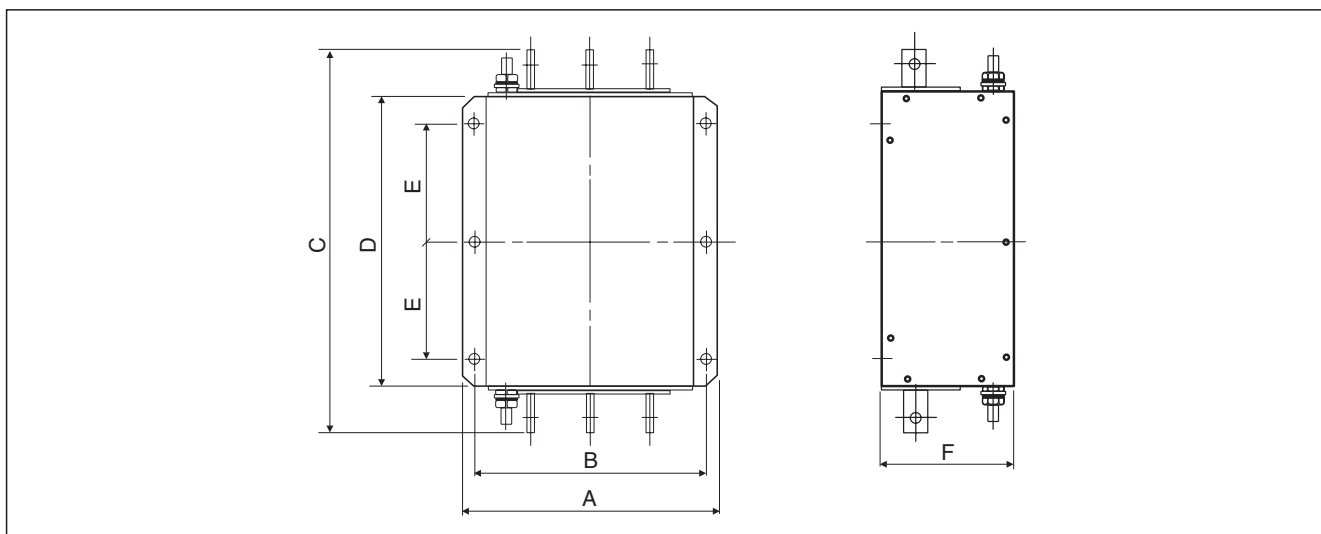
<sup>①</sup> The values shown are for the leakage currents in a balanced 400 V 50 Hz mains network under normal conditions. Higher leakage currents can occur briefly in the event of phase failures and when systems are powered on.

<sup>②</sup> Attention, no footprint mounting possible

**Filter type FN 3359/180/28 to FN 3359/250/99**


Filter type	Inverter	A	B	C	D	E	F	Weight [kg]	Power loss [W]	Leakage current <sup>①</sup> [mA]	Rated current [A]
FN 3359/180/28	FR-V 540-45 k/55 k FR-V 540L-75 k	210	185	360	300	120	120	6.5	34	< 6	180
FN 3359/250/28	FR-V 540L-90 k	230	205	360	300	120	125	7	38	< 6	250

<sup>①</sup> The values shown are for the leakage currents in a balanced 400 V 50 Hz mains network under normal conditions. Higher leakage currents can occur briefly in the event of phase failures and when systems are powered on.

**Filter type FN 3359/400/28 to FN 3359/1000/99**


Filtertyp	Inverter	A	B	C	D	E	F	Weight [kg]	Power loss [W]	Leakage current <sup>①</sup> [mA]	Rated current [A]
FN 3359/400/99	FR-V 540L-110 k-132 k	260	235	386	300	120	115	10.5	51	< 6	400
FN 3359/600/99	FR-V 540L-160 k-250 k	260	235	386	300	120	135	11	65	< 6	600

<sup>①</sup> The values shown are for the leakage currents in a balanced 400 V 50 Hz mains network under normal conditions. Higher leakage currents can occur briefly in the event of phase failures and when systems are powered on.

Specifications subject to change without notice.

Order No.: 154347-A / 12.03