

EMV

Requirements

For complying with the EMC directives of the European Community regarding the electromagnetic compatibility, the inverter has to be equipped with a noise filter across the input circuit. Additionally it has to be installed and wired according to the EMC directives. The filters are designed to reduce conducted noise voltages to comply with the limits defined for Environments 1 and 2.

To ensure a proper and safe operation of the components follow the points below:

- Ground the filter prior to applying the power supply.
- For the selection of a ground fault protective switch or relay take the leakage current of the filter into account.
- Ensure a perfect grounding of the filter, if you do not intend to use a protective switch or relay across the input circuit.

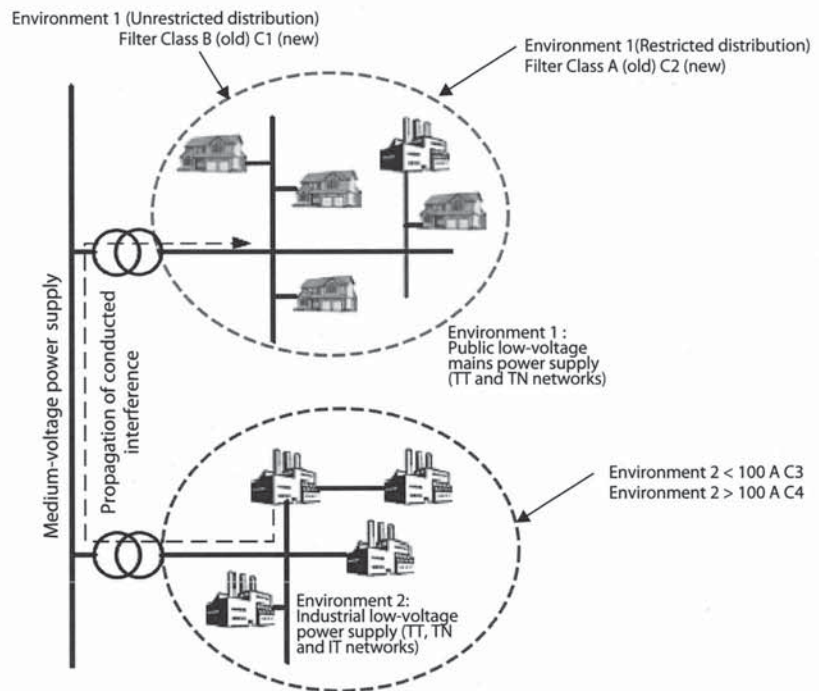
Integrated noise filters

The frequency inverters of the FR-F740/FR-A740 series are fitted with an integrated EMC noise filter for industrial environments (Environment 2). They meet the emission requirements of EN 61800-3, Category C3/C4 with 5 m motor power supply cables (shielded) at a carrier frequency of 2 kHz.

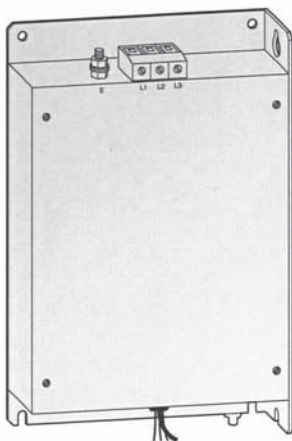
The filters listed here are thus only necessary for these inverters in special cases.

Environment

- **First environment: Residential areas**
The first environment is for drives that are connected to a low voltage mains power supply that also serves residential areas. Drives rated for this environment must conform to all EMC requirements that apply for all other devices used in residential, office and industrial environments.
- **Second environment: Industrial areas**
Drives rated for the second environment are only for use in industrial settings. Important: These drives may not be connected to a power supply that is also used by residential areas.



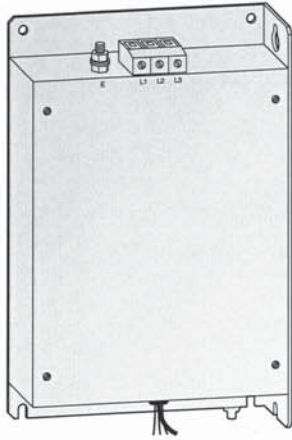
Noise Filters for FR-D700



Filter	Frequency inverter	Power loss [W]	Rated current [A]	Leakage current [mA]	Weight [kg]	Art. no.
FFR-CS-050-14A-RF1	FR-D720S-008-042	9	14	< 30	0.4	216227
FFR-CS-080-20A-RF1	FR-D720S-070	13	20	< 30	0.6	216228
FFR-CS-110-26A-RF1	FR-D720S-100	18	26	< 30	0.8	216229
FFR-CSH-036-8A-RF1	FR-D740-012-036	6	8	< 30	0.9	215007
FFR-CSH-080-16A-RF1	FR-D740-050/080	14	16	< 30	1.9	215008
FFR-MSH-170-30A-RF1	FR-D740-120/160	42	30	< 30	2.0	215005

The filters can provide conformity with following limits: C1 up to 25 m, C2 up to 100 m

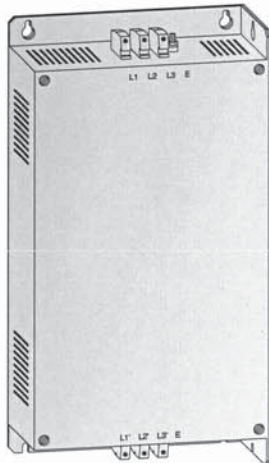
■ Noise Filters for FR-E700



Filter	Frequency inverter	Power loss [W]	Rated current [A]	Leakage current [mA]	Weight [kg]	Art. no.
FFR-MSH-040-8A-RF1	FR-E740-016-040	17	8	< 30	1.1	214953
FFR-MSH-095-16A-RF1	FR-E740-060/095	26	16	< 30	1.2	215004
FFR-MSH-170-30A-RF1	FR-E740-120/170	42	30	< 30	2.0	215005
FFR-MSH-300-50A-RF1	FR-E740-230/300	26	50	< 30	2.8	215006

The filters can provide conformity with following limits: C1 up to 25 m, C2 up to 100 m

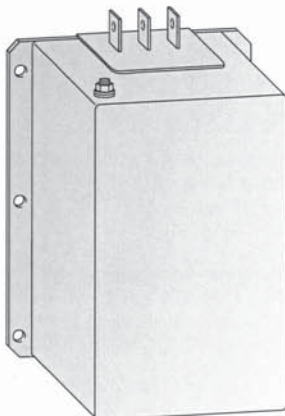
■ Noise Filters for FR-A/F740-00023 to -01800



Filter	Frequency inverter	Power loss [W]	Rated current [A]	Leakage current [mA]	Weight [kg]	Art. no.
FFR-BS-00126-18A-SF100	FR-A/F740-00023-00126	11.5	18	< 30	1.25	193677
FFR-BS-00250-30A-SF100	FR-A/F740-00170-00250	15.8	30	< 30	1.8	193678
FFR-BS-00380-55A-SF100	FR-A/F740-00310-00380	27.1	55	< 30	2.42	193679
FFR-BS-00620-75A-SF100	FR-A/F740-00470-00620	43.9	75	< 30	4.25	193680
FFR-BS-00770-95A-SF100	FR-A/F740-00770	45.8	95	< 30	6.7	193681
FFR-BS-00930-120A-SF100	FR-A/F740-00930	44.9	120	< 30	10.0	193682
FFR-BS-01800-180A-SF100	FR-A/F740-01160-01800	60.7	180	< 30	12.0	193683

The filters can provide conformity with following limits: C1 up to 20 m, C2 up to 100 m, C3 up to 100 m

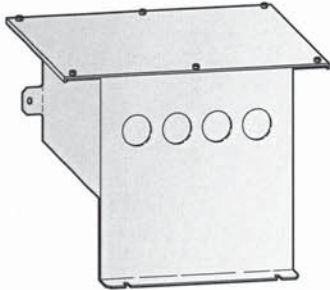
■ Noise Filters for FR-A/F740-02160 to -12120



Filter	Frequency inverter	Power loss [W]	Rated current [A]	Leakage current [mA]	Weight [kg]	Art. no.
FN 3359-250-28	FR-A/F740-02160-02600	38	250	< 6	7	104663
FN 3359-400-99	FR-A/F740-03250-04320	51	400	< 6	10.5	104664
FN 3359-600-99	FR-A/F740-04810-06100	65	600	< 6	11	104665
FN 3359-1000-99	FR-A/F740-06830-09620	84	1000	< 6	18	104666
FN 3359-1600-99	FR-A/F740-10940-12120	130	1600	< 6	27	130229

The filters can provide conformity with following limits: C2 up to 100 m, C4 up to 100 m

■ Noise Filters for FR-F746-00023 to -01160



Noise Filters conforming to EN 61800-3

The noise filters listed below make it possible to comply with the requirements for Environment 1 (unrestricted distribution) with shielded motor cables up to 20 m long and the requirements of Environment 1 (restricted distribution) with shielded motor cables up to 100 m long. This also provides compliance with the 100 A limits for Environment 2 with shielded cables up to 100 m long.

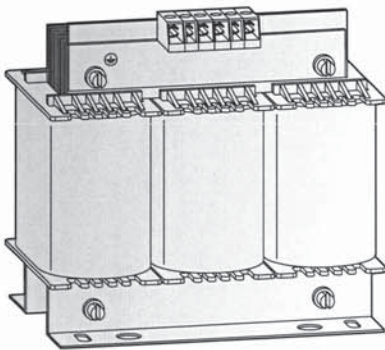
They meet the emission requirements of EN 61800-3, Category C1 and EN 55011. The frequency inverters of the FR-F746 series are fitted with an integrated EMC noise filter for industrial environments (Environment 2). They meet the emission requirements of EN 61800-3, Category C3 with 5 m motor power supply cables (shielded) at a clock frequency of 2 kHz.

Filter	Frequency inverter	Power loss ^① [W]	Rated current [A]	Leakage current [mA]	Weight [kg]	Art. no.
FFR-AF-IP54-21A-SM2	FR-F746-00023-00126	9.26	21	< 30	3.2	201551
FFR-AF-IP54-44A-SM2	FR-F746-00170-00250	20.3	44	< 30	4.4	201552
FFR-AF-IP54-62A-SM2	FR-F746-00310-00380	23	62	< 30	5.4	201553
FFR-AF-IP54-98A-SM2	FR-F746-00470-00620	51.8	98	< 30	7.7	201554
FFR-AF-IP54-117A-SM2	FR-F746-00770	61.6	117	< 30	10.6	201555
FFR-AF-IP54-172A-SM2	FR-F746-00930-01160	128.7	172	< 30	16	201556

① Power dissipation at 20 °C and rated current with copper cables

The filters can provide conformity with following limits: C1 up to 20 m, C2 up to 100 m, C3 up to 100 m

■ du/dt Filters for FR-D700/E700/F700 and FR-A700



du/dt Filter

The du/dt output filter efficiently reduces the voltage rise time, motor heat

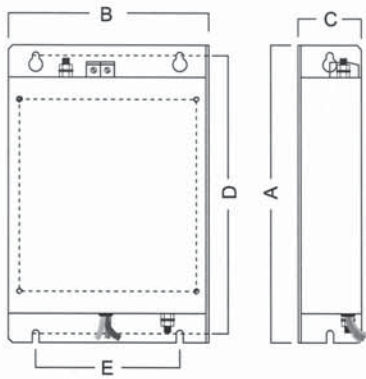
generation, insulation stressing and motor noise generation.

du/dt Filter	Frequency inverter	Power loss [W]	Rated current [A]	Weight [kg]	Dimensions (W×H×D)	Art. no.
FFR-DT-10A-SS1	FR-D740-012-080 FR-E740-016-060 FR-A/F740-00023-00083 ^①	25	10	1,2	125×65×120	209755
FFR-DT-25A-SS1	FR-D740-120/160 FR-E740-095-170 FR-A/F740-00126-00250 ^①	45	25	2,5	125×80×140	209756
FFR-DT-47A-SS1	FR-E740-230/300 FR-A/F740-00310-00470 ^①	60	47	6,1	155×110×195	209757
FFR-DT-93A-SS1	FR-A/F740-00620-00930 ^①	75	93	7,4	190×100×240	209758
FFR-DT-124A-SS1	FR-A740-01160/01800 ^① FR-F740-01160	110	124	8,2	190×150×170	209759
FFR-DT-182A-SS1	FR-A740-02160 ^① FR-F740-01800	140	182	16	210×160×185	209760
FFR-DT-330A-SS1	FR-A740-02600-03610 ^① FR-F740-02160-03250	240	330	32	240×240×220	209761
FFR-DT-500A-SS1	FR-A740-04320-05470 ^① FR-F740-03610-04810	340	500	35	240×220×325	209762
FFR-DT-610A-SS1	FR-A740-06100 ^① FR-F740-05470/06100	380	610	37	240×230×325	209763
FFR-DT-683A-SS1	FR-A740-06830/07700 ^① FR-F740-06830	410	683	38	240×230×325	209764
FFR-DT-790A-SS1	FR-A740-08660 ^① FR-F740-07700	590	790	43	300×218×355	209765
FFR-DT-1100A-SS1	FR-A740-09620-12120 ^① FR-F740-08660-10940	760	1100	66	360×250×380	209766
FFR-DT-1500A-SS1	FR-F740-12120	②	1500	97 ^②	360×265×485	209767
FFR-DT-1920A-SS1	②	1000	1920	105 ^②	360×260×595	209768

① For FR-A700: Suitable for 200 % overload (ND). If the overload is lower (higher rated current) please use a filter one size higher.

② Under review, may be subject to change

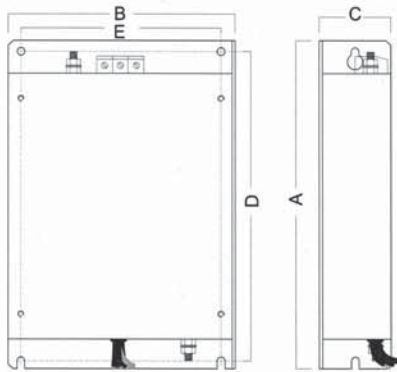
Noise Filters for FR-D720S



Filter	Frequency inverter	A	B	C	D	E
FFR-CS-050-14A-RF1	FR-D720S-008-042	168	72	38	158	56
FFR-CS-080-20A-RF1	FR-D720S-070	168	113	38	158	96
FFR-CS-110-26A-RF1	FR-D720S-100	214	145	46	200	104

All dimensions in mm

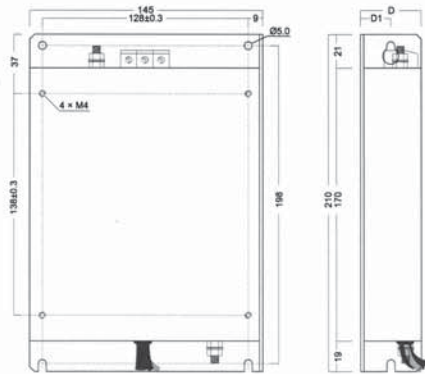
Noise Filters for FR-D740



Filter	Frequency inverter	A	B	C	D	E
FFR-CSH-036-8A-RF1	FR-D740-012-036	168	114	45	158	96
FFR-CSH-080-16A-RF1	FR-D740-050/080	168	114	45	158	96
FFR-MSH-170-30A-RF1	FR-D740-120/160	210	225	55	198	208

All dimensions in mm

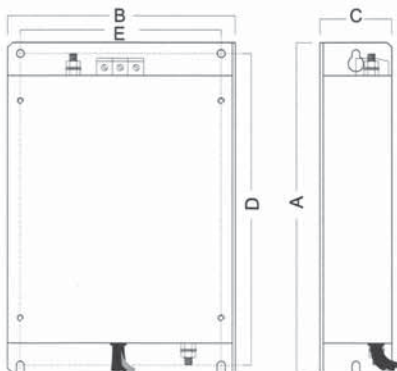
Noise Filters for FR-E740-016-095



Filter	Frequency inverter	D	D1
FFR-MSH-040-8A-RF1	FR-E740-016-040	38	19
FFR-MSH-095-16A-RF1	FR-E740-060/095	46	23

All dimensions in mm

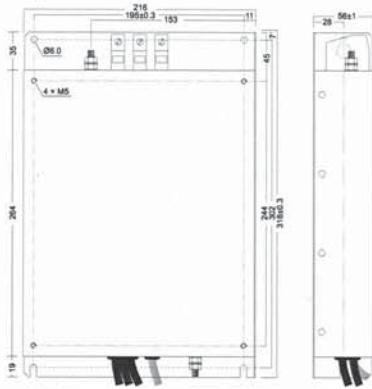
Noise Filter for FR-E740-120/170



Filter	Frequency inverter	A	B	C	D	E
FFR-MSH-170-30A-RF1	FR-E740-120/170	210	225	55	198	208

All dimensions in mm

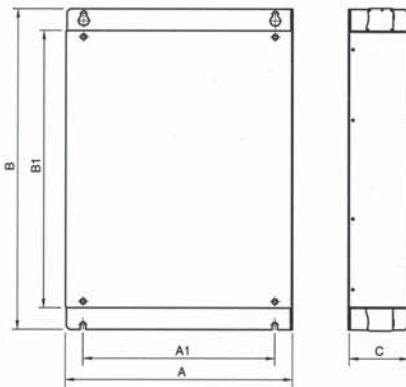
■ Noise Filter for FR-E740-230/300



Filter	Frequency inverter
FFR-MSH-300-50A-RF1	FR-E740-230/300

All dimensions in mm

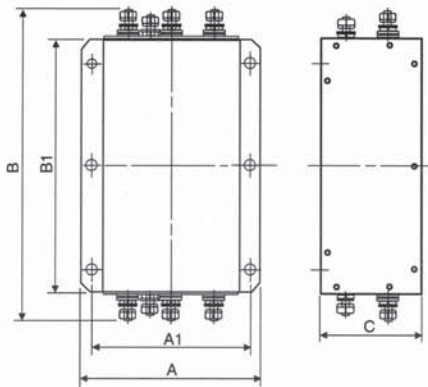
■ Noise Filters for FR-A/F740-00023 to -01800



Filter	Frequency inverter	A	A1	B	B1	C
FFR-BS-00126-18A-SF100	FR-A/F740-00023-00126	150	110	315	260	50
FFR-BS-00250-30A-SF100	FR-A/F740-00170/00250	220	180	315	260	60
FFR-BS-00380-55A-SF100	FR-A/F740-00310/00380	221,5	180	360	300	80
FFR-BS-00620-75A-SF100	FR-A/F740-00470/00620	251,5	210	476	400	80
FFR-BS-00770-95A-SF100	FR-A/F740-00770	340	280	626	550	90
FFR-BS-00930-120A-SF100	FR-A/F740-00930	450	380	636	550	120
FFR-BS-01800-180A-SF100	FR-A/F740-00930/01800	450	380	652	550	120

All dimensions in mm

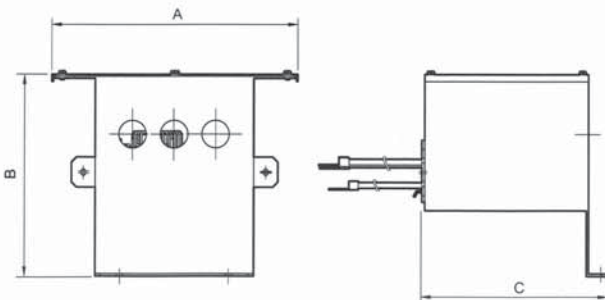
■ Noise Filters for FR-A/F740-02160 to -12120



Filter	Frequency inverter	A	A1	B	B1	C
FN 3359-250-28	FR-A/F740-02160-02600	230	205	360	300	125
FN 3359-400-99	FR-A/F740-03250-04320	260	235	386	300	115
FN 3359-600-99	FR-A/F740-04810-06100	260	235	386	300	135
FN 3359-1000-99	FR-A/F740-06830-09620	280	255	456	350	170
FN 3359-1600-99	FR-A/F740-10940-12120	300	275	586	400	160

All dimensions in mm

■ Noise Filters for FR-F746-00023 to -01160



Filter	Frequency inverter	A	B	C
FFR-AF-IP54-21A-SM 2	FR-A/F746-00023-00126	248,5	201	186,5
FFR-AF-IP54-44A-SM 2	FR-A/F746-00170-00250	318,5	231	231,5
FFR-AF-IP54-62A-SM 2	FR-A/F746-00310-00380	318,5	251	239,5
FFR-AF-IP54-98A-SM 2	FR-A/F746-00470-00620	350	251	308
FFR-AF-IP54-117A-SM 2	FR-A/F746-00770	325	185	308
FFR-AF-IP54-172A-SM 2	FR-A/F746-00930-01160	464	301,5	481

All dimensions in mm