

Ranges Covered

Inverters	200V Single Phase	200V Three Phase	400V Three Phase
FVR-C11S	0.1 to 2.2kW		
FVR-E11S	0.1 to 2.2kW		0.4 to 7.5kW
FRN-G11S			0.4 to 400kW
FRN-P11S			5.5 to 400kW



Rasmi Electronics Ltd.
RFI and EMC Filters

Footprint and Block RFI filters for

FUJI ELECTRIC

FVR-C11S, FVR-E11S, FRN-G11S and P11S
motor inverters



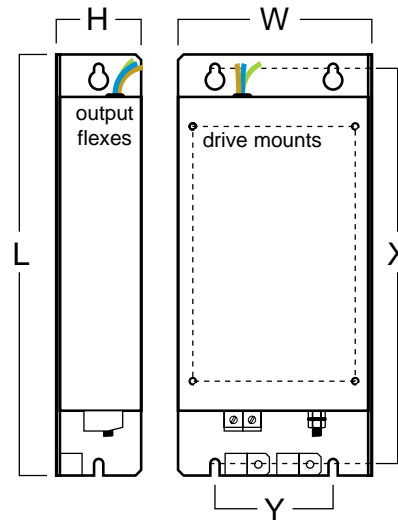
MADE IN THE UK

FVR-C11S



- The **EFL-C11** range, especially for Fuji FVR-C11S Series inverters.
- Help to ensure EMC compliance of machinery and installations using C11S drives.
- Footprint filters mount between the inverter and the panel, saving valuable space inside wiring cabinets.
- All filters are designed and manufactured to UL requirements and are CE marked.

Dimensions



Applied FVR-C11S Inverter	Filter Part No	Rated Current	Max Rated Voltage	Leakage current	External L x W x H (mm)	Mount Dims X x Y (mm)	Inverter Fixing	EMC Tested	UL
FVR-0.1C11S-7EN FVR-0.2C11S-7EN	EFL-0.2C11-7	3A	1ph, 250V	3.5mA	180 x 86 x 38	155 x 60	4 x M4	✓	✓
FVR-0.4C11S-7EN FVR-0.75C11S-7EN	EFL-0.75C11-7	12A	1ph, 250V	3.5mA	180 x 86 x 38	155 x 60	4 x M4	✓	✓
FVR-1.5C11S-7EN	EFL-1.5C11-7	20A	1ph, 250V	3.5mA	190 x 117 x 46	165 x 89	4 x M4	✓	✓
FVR-2.2C11S-7EN	EFL-2.2C11-7	29A	1ph, 250V	3.5mA	240 x 148 x 46	216 x 118	4 x M4	✓	✓

UL Approval Status - ✓ Complete, ● Pending

Earth Leakage Measurements

In single phase applications, the earth leakage current is present all of the time.

For three phase applications - under normal conditions, with the three phases balanced, earth leakage currents are extremely small - the max values stated are worst possible values such as would occur momentarily during switch on or failure of one or two phases.

Design and Test Criteria

Generally with motor drive systems, the emission levels are greatly affected by the length of the cable between the drive itself and the motor - longer cables will cause considerably higher emissions.

The inverter / filter combinations here, have been designed and tested to achieve compliance to :-

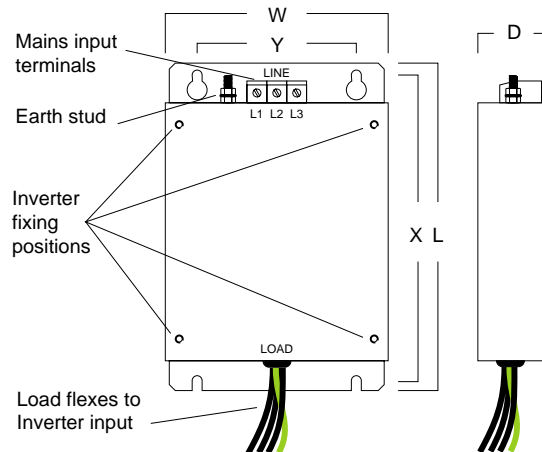
EN 55022:1994, Class B for use in domestic / light industrial environments (Equivalent to the RF emissions tests of Power Drive Standard EN 61800-3:1996 for drives with <25A input current) when fitted with up to 25m motor output cable and to EN 55011:1991 Group 1, Class A for use in industrial environments (Equivalent to the RF emissions tests of Power Drive Standard EN 61800-3:1996 for drives with >25A input current) when fitted with up to 50m motor output cable.

FVR-E11S



- The **EFL-E11** range, especially for Fuji FVR-E11S Series inverters.
- Help to ensure EMC compliance of machinery and installations using E11S drives.
- Footprint filters mount between the inverter and the panel, saving valuable space inside wiring cabinets.
- All filters are designed and manufactured to UL requirements and are CE marked.

Dimensions

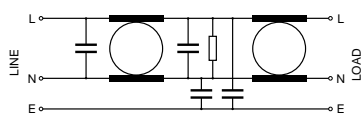


Applied FVR-E11S Inverter	Filter Part No	Rated Current	Max Rated Voltage	Leakage current Nom / Max	External L x W x H (mm)	Mount Dims X x Y (mm)	Inverter Fixing	EMC Tested	UL
FVR-0.1E11S-7EN FVR-0.2E11S-7EN FVR-0.4E11S-7EN	EFL-0.4E11-7	7A	1ph, 250V	7.0mA	189 x 71 x 38	178 x 55	4 x M4	✓	●
FVR-0.75E11S-7EN	EFL-0.75E11-7	12A	1ph, 250V	7.0mA	191 x 110 x 40	165 x 80	4 x M4	✓	●
FVR-1.5E11S-7EN FVR-2.2E11S-7EN	EFL-2.2E11-7	29A	1ph, 250V	18mA	191 x 174 x 40	165 x 145	4 x M4	✓	●
FVR-0.4E11S-4EN FVR-0.75E11S-4EN	EFL-0.75E11-4	5A	3ph, 480V	0.8 / 70mA	191 x 110 x 40	165 x 80	4 x M4	✓	●
FVR-1.5E11S-4EN FVR-2.2E11S-4EN	EFL-2.2E11-4	10A	3ph, 480V	0.8 / 70mA	191 x 110 x 40	165 x 80	4 x M4	✓	●
FVR-4.0E11S-4EN	EFL-4.0E11-4	15A	3ph, 480V	0.8 / 70mA	191 x 174 x 40	165 x 145	4 x M4	✓	●
FVR-5.5E11S-4EN FVR-7.5E11S-4EN	EFL-7.5E11-4	30A	3ph, 480V	0.8 / 70mA	278 x 182 x 50	252 x 145	4 x M5	✓	●

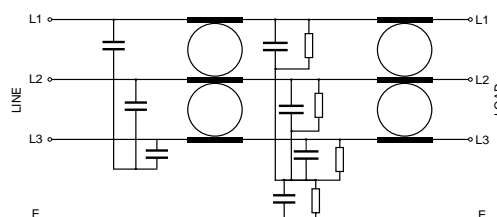
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Typical Circuit Schematics

Single Phase



Three Phase

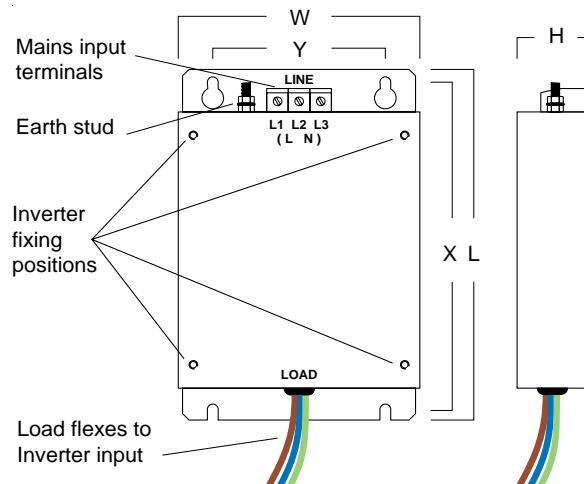


FRN-G11S FRN-P11S

- The **EFL-G11** range, especially for Fuji FRENIC5000 G11S and P11S Series inverters up to 22kW.
- Help to ensure EMC compliance of machinery and installations using G11S and P11S drives.
- Footprint filters mount between the inverter and the panel, saving valuable space inside wiring cabinets.
- All filters are designed and manufactured to UL requirements and are CE marked.



EFL Footprint Type Dimensions



Three Phase 480V ac

Applied FRN-G11S Inverter	Applied FRN-P11S Inverter	Filter Part No	Rated Current	Leakage current Nom / Max	External L x W x H (mm)	Mount Dims X x Y (mm)	Inverter Fixing	EMC Tested	UL
FRN0.4G11S-4EN FRN0.75G11S-4EN		EFL-0.75G11-4	5A	0.3 / 40mA	320 x 116 x 42	293 x 90	4 x M5	✓	●
FRN1.5G11S-4EN FRN2.2G11S-4EN FRN4.0G11S-4EN		EFL-4.0G11-4	12A	0.3 / 40mA	320 x 116 x 42	293 x 90	4 x M5	✓	●
FRN5.5G11S-4EN FRN7.5G11S-4EN	FRN5.5P11S-4EN FRN7.5P11S-4EN	EFL-7.5G11-4	35A	0.3 / 40mA	320 x 155 x 45	293 x 105	4 x M5	✓	●
FRN11G11S-4EN FRN15G11S-4EN	FRN11P11S-4EN FRN15P11S-4EN	EFL-15G11-4	50A	0.3 / 40mA	341 x 225 x 48	311 x 167	4 x M6	✓	●
FRN18.5G11S-4EN FRN22G11S-4EN	FRN18.5P11S-4EN FRN22P11S-4EN	EFL22G11-4	72A	0.3 / 40mA	480 x 250 x 70	449 x 185	4 x M6	✓	●

UL Approval Status - ✓ Complete, ● Pending

Earth Leakage Measurements

For three phase applications - under normal conditions, with the three phases balanced, earth leakage currents are extremely small - the max values stated are worst possible values such as would occur momentarily during switch on or failure of one or two phases.

Design and Test Criteria

Generally with motor drive systems, the emission levels are greatly affected by the length of the cable between the drive itself and the motor - longer cables will cause considerably higher emissions.

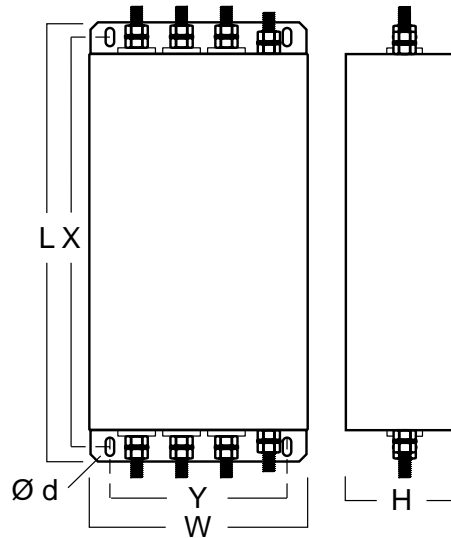
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EN 55022:1994, Class B for use in domestic / light industrial environments (Equivalent to the RF emissions tests of Power Drive Standard EN 61800-3:1996 for drives with <25A input current) when fitted with up to 25m motor output cable and to EN 55011:1991 Group 1, Class A for use in industrial environments (Equivalent to the RF emissions tests of Power Drive Standard EN 61800-3:1996 for drives with >25A input current) when fitted with up to 50m motor output cable.

FRN-G11S FRN-P11S

- The **RF-F11** range, especially for Fuji FRENIC5000 G11S and P11S Series inverters larger than 22kW.
- Help to ensure EMC compliance of machinery and installations using G11S and P11S drives.
- Block filters mount beside the inverter.
- All filters are designed and manufactured to UL requirements and are CE marked.

RF Block Type Dimensions

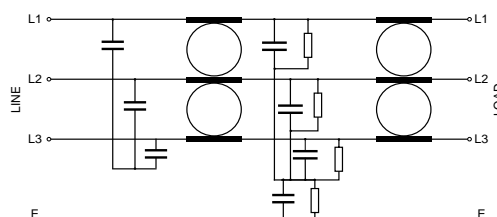


Three Phase 480V ac

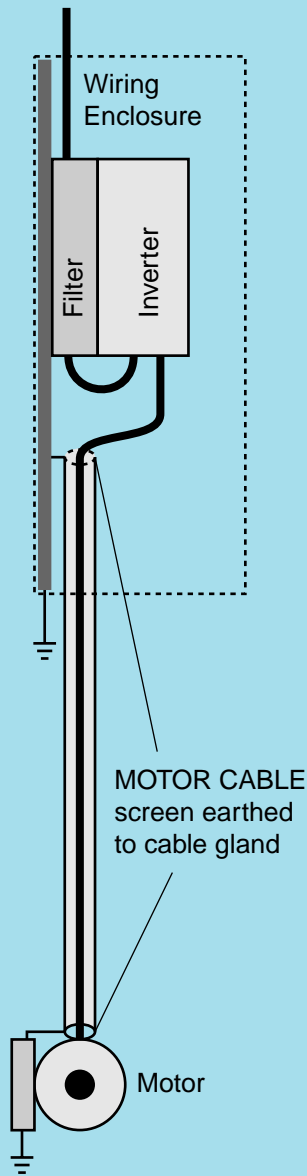
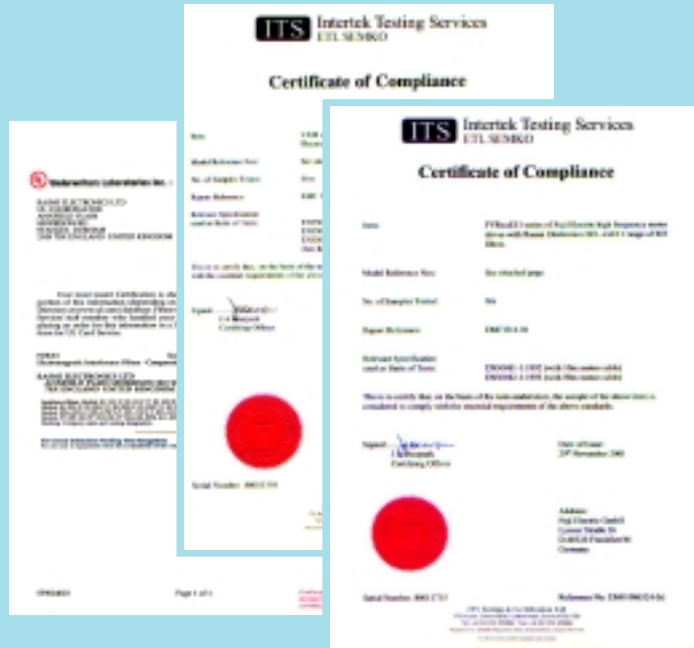
Applied FRN-G11S Inverter	Applied FVR-P11S Inverter	Filter Part No	Rated Current	Leakage current Nom / Max	External L x W x H (mm)	Mount Dims X x Y (mm)	EMC Tested	UL
FRN30G11S-4EN	FRN30P11S-4EN	RF 3100-F11	100A	1.0 / 85mA	435 x 200 x 130	408 x 166	✓	●
FRN37G11S-4EN FRN45G11S-4EN FVR55G11S-4EN FVR75G11S-4EN	FRN37P11S-4EN FRN45P11S-4EN FVR55P11S-4EN FVR75P11S-4EN FVR90P11S-4EN	RF 3180-F11	180A	1.0 / 85mA	495 x 200 x 160	468 x 166	✓	●
FVR90G11S-4EN FVR110G11S-4EN FVR132G11S-4EN	FVR110P11S-4EN FVR132P11S-4EN	RF 3280-F11	280A	1.5 / 160mA	587 x 250 x 200	560 x 170	✓	●
FVR160G11S-4EN FVR200G11S-4EN FVR220G11S-4EN	FVR160P11S-4EN FVR200P11S-4EN FVR220P11S-4EN	RF 3400-F11	400A	1.5 / 160mA	587 x 250 x 200	560 x 170	✓	●
FVR280G11S-4EN FVR315G11S-4EN FVR400G11S-4EN	FVR280P11S-4EN FVR315P11S-4EN FVR355P11S-4EN FVR400P11S-4EN	RF 3880-F11	880A	1.5 / 160mA	688 x 365 x 180	640 x 300	✓	●

UL Approval Status - ✓ Complete, ● Pending

Typical Circuit Schematic



UL approval documentation and EMC Test Certificates from Independent Test House



Filter Installation Notes

To conform to EMC directives, it is essential that good wiring practice is observed and that all installation recommendations are followed.

- ◆ The usual safety procedures when working with electrical equipment must be followed and all electrical connections to the filter, inverter & motor must be made by a qualified electrical technician.
- ◆ Filters should be fitted as closely as possible to the incoming mains supply of the wiring enclosure, usually directly after the enclosures circuit breaker or supply switch.
- ◆ Care should be taken to remove any paint etc. from filter and inverter mounting holes and face area of the panel to ensure the best possible earthing of the units.
- ◆ All lead lengths should be kept as short as possible and incoming mains, outgoing motor cables and control cables should be kept well separated. Cable earth screens should only be stripped back as far as necessary to make connections - screens should be securely earth bonded to the wiring panel.

DUE TO CONTINUAL PRODUCT DEVELOPMENT, SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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