

3-phase filters FN 3100 / FN 3110

EMC/RFI filter for regenerative motor drives



- Exceptional broadband attenuation performance from 10kHz up to 30MHz
- Equally suitable for conventional and regenerative motor drives (latter with additional line reactor only)
- Slim and user-friendly book-style design with touch-safe terminal blocks for minimum space and maximum safety
- Enables compliance with class B limits

Approvals



FN 3100 up to 150A

ROHS
2002/95/EC

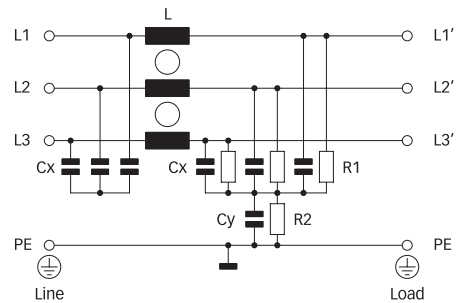
Technical specifications

Maximum continuous operating voltage:	3x 520/300VAC (FN 3100) 3x 480/277VAC (FN 3110)
Operating frequency:	dc to 60Hz
Rated currents:	35 to 300A @ 50°C
High potential test voltage:	P → E 2750VDC for 2 sec (FN 3100) P → P 2250VDC for 2 sec (FN 3100) P → E 2650VDC for 2 sec (FN 3110) P → P 2100VDC for 2 sec (FN 3110)
Protection category:	IP20
Overload capability:	4x rated current at switch on, 1.5x rated current for 1 minute, once per hour
Temperature range (operation and storage):	-25°C to +100°C (25/100/21)
Flammability corresponding to:	UL 94V-2 or better
Design corresponding to:	UL 1283, CSA 22.2 No. 8 1986, EN 133200
MTBF @ 50°C/400V (Mil-HB-217F):	>400,000 hours

Features and benefits

- High-performance filter for mainly industrial motor drive applications with significant interference levels.
- Attenuation performance for Class B compliance in applications comprising multiple motor drives (e.g. machine tool with up to 8 driving axes with ~10 to 20m motor cable each).
- Broadband filter performance with low frequency attenuation down to 10kHz for reliable suppression of conducted interference in applications with regenerative motor drives.
- Slim book-style shape requiring minimum cabinet space and allowing convenient installation right beside the motor drive.
- Touch-safe terminal blocks provide unsurpassed electrical safety and contacting cross section according to EN 60204-1 installation standard.
- For even better filter specifications, please consider FN 5120H series from Schaffner.

Typical electrical schematic



Typical applications

- Conventional motor drives with long motor cables and high interference levels
- Four quadrant motor drives and servo drives with energy regeneration mode (in combination with a suitable line reactor)
- Industrial applications comprising power conversion devices, such as machinery, machine tools and process automation equipment
- Uninterruptible power supplies (UPS)
- Converters for alternative energy generation
- Thyristor drives
- Elevators and cranes

Filter selection table

Filter	Rated current @ 50°C (40°C)	Typical drive power rating*	Leakage current** @ 400VAC/50Hz	Power loss @ 25°C/50Hz	Input/Output connections	Weight [kg]
	[A]	[kW]	[mA]	[W]		
FN 3100-35-33	35 (38.4)	22	48.9	11.8	-33	2.3
FN 3100-50-34	50 (54.8)	30	66.1	18.0	-34	3.4
FN 3100-80-35	80 (87.6)	45	71.5	25.9	-35	5.3
FN 3100-110-35	110 (120.5)	55	71.5	32.7	-35	5.4
FN 3100-150-40	150 (164.3)	75	71.5	50.6	-40	8.5
FN 3100-200-40	200 (219)	110	71.5	67.2	-40	9.1
FN 3100-230-40	230 (230)	132	71.5	36.5	-40	9.2
FN 3100-300-99	300 (329)	160	71.5	54.0	-99	11.8
FN 3110-50-52	50 (54.8)	30	66.1	19.5	-52	2.7
FN 3110-80-35	80 (87.6)	45	71.4	36.5	-35	4.4

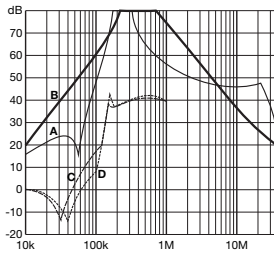
* Calculated at rated current, 480VAC and cos phi = 0.8. The exact value depends upon the efficiency of the drive, the motor and the entire application.

** Maximum leakage under normal operating conditions. Note: if two phases are interrupted, worst case leakage could reach 5.3 times higher levels.

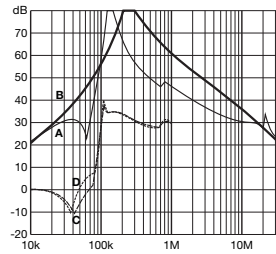
Typical filter attenuation

Per CISPR 17; A = 50Ω/50Ω sym; B = 50Ω/50Ω asym; C = 0.1Ω/100Ω sym; D = 100Ω/0.1Ω sym

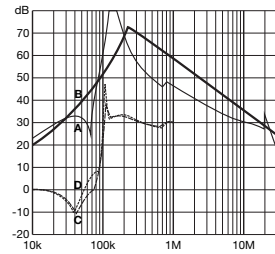
35 to 80A types



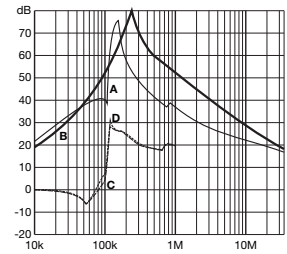
110 and 150A types



200A types

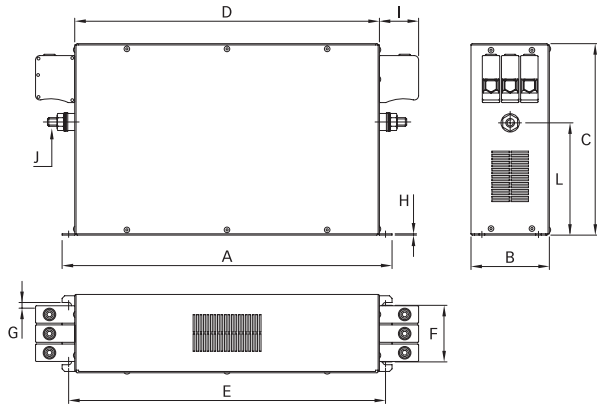


230 and 300A types

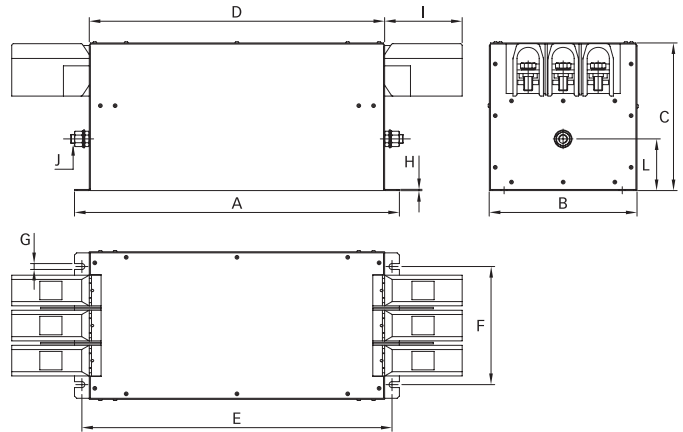


Mechanical data

35 to 230A types



300A types



Dimensions

	FN 3100 35A	50A	80A	110A	150A	200A	230A	300A	FN 3110 50A	80A
A	335	329	379	379	438	438	438	440	270	310
B	60	80	90	90	110	110	110	200	80	110
C	150	185	220	220	240	240	240	200	135	170
D	305	300	350	350	400	400	400	400	240	280
E	320	314	364	364	413	413	413	420	255	295
F	35	55	65	65	80	80	80	160	60	80
G	6.5	6.5	6.5	6.5	6.5	6.5	6.5	8	6.5	6.5
H	1	1.5	1.5	1.5	4	4	4	1.5	1.5	1.5
I	25	39	45	45	50	50	50	105	19	45
J	M5	M6	M10	M10	M10	M10	M10	M12	M6	M10
L	93.5	107	129	129	108	108	108	70	60	91.5

All dimensions in mm; 1 inch = 25.4mm
Tolerances according: ISO 2768 / EN 22768

Filter input/output connector cross sections

	-33	-34	-35	-40	-52	-99
Solid wire	16mm ²	35mm ²	50mm ²	95mm ²	25mm ²	—
Flex wire	10mm ²	25mm ²	50mm ²	95mm ²	16mm ²	150mm ²
AWG type wire	AWG 6	AWG 2	AWG 1/0	AWG 4/0	AWG 4	AWG 6/0
Recommended torque	1.5 - 1.8Nm	4.0 - 4.5Nm	7 - 8Nm	17 - 20Nm	1.9 - 2.2Nm	27 - 30Nm

Please visit www.schaffner.com to find more details on filter connectors.

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