

EMC/EMI Filter for Regenerative Motor Drives

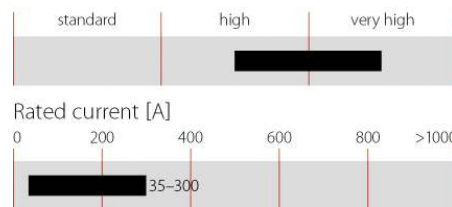


- Exceptional broadband attenuation performance from 10 kHz up to 30 MHz
- Equally suitable for conventional and regenerative motor drives (latter with additional line reactor only)
- Slim and user-friendly book-style design with touch-safe terminal blocks for minimum space and maximum safety
- Enables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



Performance indicators

Attenuation performance



Technical specifications

Design corresponding to	UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939
Flammability corresponding to	UL 94 V-2 or better
High potential test voltage	P → E 2750 VDC for 2 sec P → P 2250 VDC for 2 sec
Maximum continuous operating voltage	3x 520/300 VAC
MTBF @ 50°C/400V (Mil-HB-217F)	>400,000 hours
Operating frequency	dc to 60 Hz
Overload capability	4x rated current at switch on, 1.5x rated current for 1 minute, once per hour
Protection category	IP20
Rated currents	35 to 300 A @ 50 °C
Temperature range (operation and storage)	-25 °C to +100 °C (25/100/21)

Approvals



(FN 3100 up to 150 A)

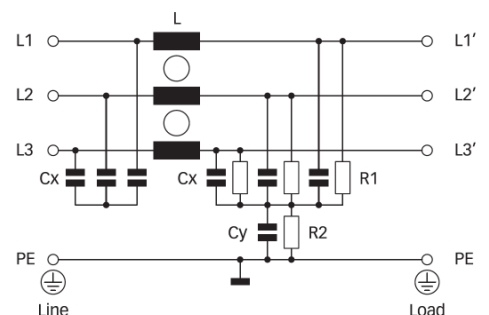
Features and benefits

- 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 20 m motor cable each)
- Broadband filter performance with low frequency attenuation down to 10 kHz 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 3120 H series from Schaffner

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 renewable energy generation
- Thyristor drives
- Elevators and cranes

Typical electrical schematic



Filter selection table

Filter	Rated current @ 50 °C (40 °C)	Typical drive power rating*	Leakage current** @ 400 VAC/50 Hz	Power loss @ 25 °C/50 Hz	Input/Output connections		Weight
	[A]	[kW]	[mA]	[W]			[kg]
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

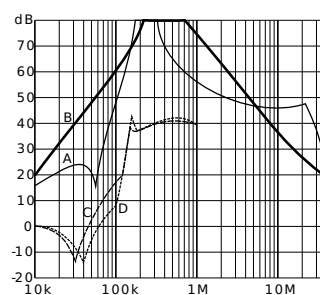
* Calculated at rated current, 480 VAC and $\cos \phi = 0.8$. The exact value depends upon the efficiency of the drive, the motor and the entire application.

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

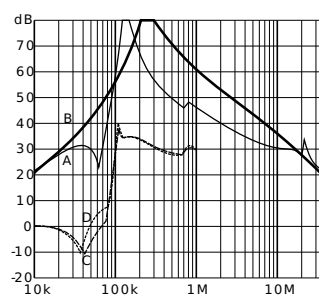
Typical filter attenuation

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

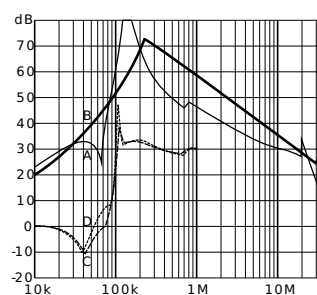
35 to 80 A types



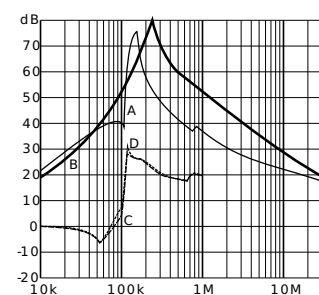
110 and 150 A types



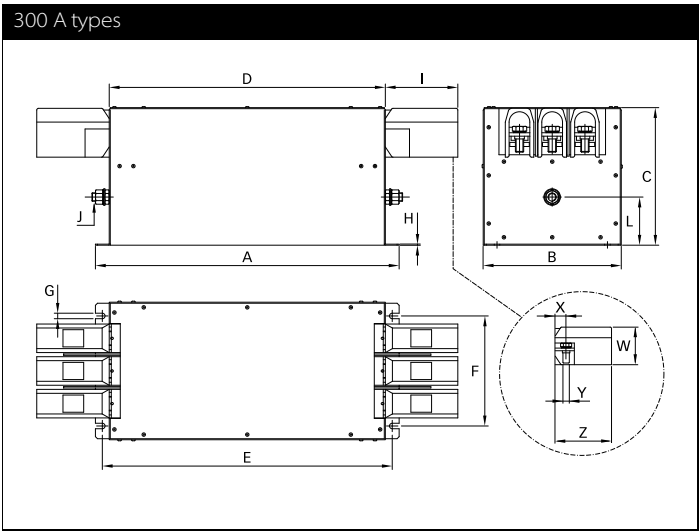
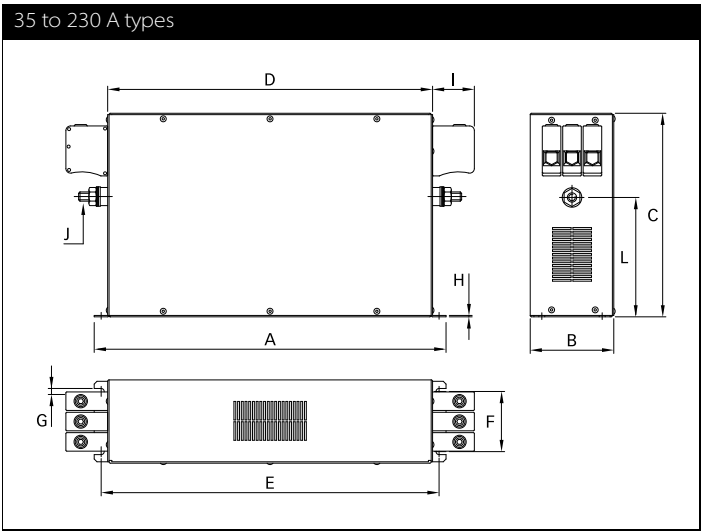
200 A types



230 and 300 A types



Mechanical data



Dimensions

	35 A	50 A	80 A	110 A	150 A	200 A	230 A	300 A
A	335	329	379	379	438	438	438	440
B	60	80	90	90	110	110	110	200
C	150	185	220	220	240	240	240	200
D	305	300	350	350	400	400	400	400
E	320	314	364	364	413	413	413	420
F	35	55	65	65	80	80	80	160
G	6.5	6.5	6.5	6.5	6.5	6.5	6.5	8
H	1	1.5	1.5	1.5	4	4	4	1.5
I	25	39	45	45	51	51	51	105
J	M5	M6	M10	M10	M10	M10	M10	M12
L	93.5	107	129	129	108	108	108	70
W								71.5
X								~22
Y								M12
Y								~105

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

Filter input/output connector cross sections

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

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