

# 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

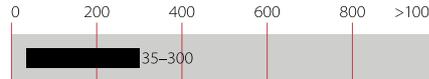


### Performance indicators

Attenuation performance



Rated current [A]



### 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

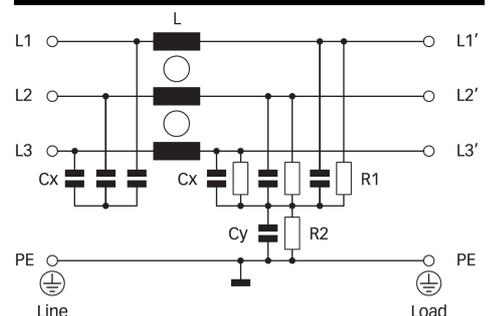
### Technical specifications

<b>Maximum continuous operating voltage</b>	3x 520/300 VAC
<b>Operating frequency</b>	dc to 60 Hz
<b>Rated currents</b>	35 to 300 A @ 50°C
<b>High potential test voltage</b>	P → E 2750 VDC for 2 sec P → P 2250 VDC for 2 sec
<b>Protection category</b>	IP 20
<b>Overload capability</b>	4x rated current at switch on, 1.5x rated current for 1 minute, once per hour
<b>Temperature range (operation and storage)</b>	-25°C to +100°C (25/100/21)
<b>Flammability corresponding to</b>	UL 94 V-2 or better
<b>Design corresponding to</b>	UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939
<b>MTBF @ 50°C/400 V (Mil-HB-217F)</b>	>400,000 hours

### 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]
<b>FN 3100-35-33</b>	35 (38.4)	22	48.9	11.8	-33		2.3
<b>FN 3100-50-34</b>	50 (54.8)	30	66.1	18.0	-34		3.4
<b>FN 3100-80-35</b>	80 (87.6)	45	71.5	25.9	-35		5.3
<b>FN 3100-110-35</b>	110 (120.5)	55	71.5	32.7	-35		5.4
<b>FN 3100-150-40</b>	150 (164.3)	75	71.5	50.6	-40		8.5
<b>FN 3100-200-40</b>	200 (219)	110	71.5	67.2	-40		9.1
<b>FN 3100-230-40</b>	230 (230)	132	71.5	36.5	-40		9.2
<b>FN 3100-300-99</b>	300 (329)	160	71.5	54.0		-99	11.8

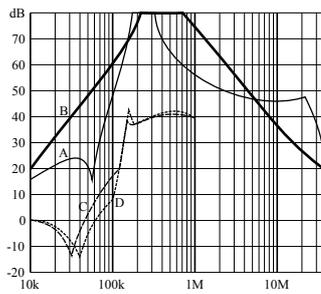
\* Calculated at rated current, 480 VAC and cos phi=0.8. The exact value depends upon the efficiency of the drive, the motor and the entire application.

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

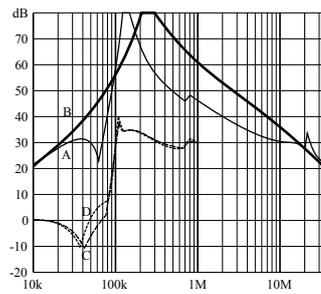
### Typical filter attenuation

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

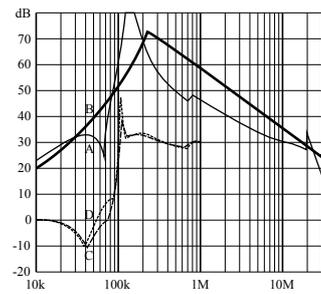
35 to 80 A types



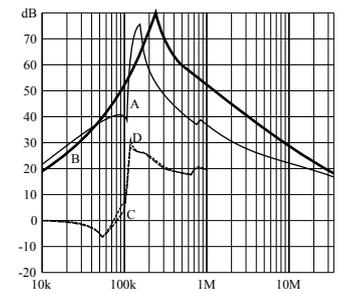
110 and 150 A types



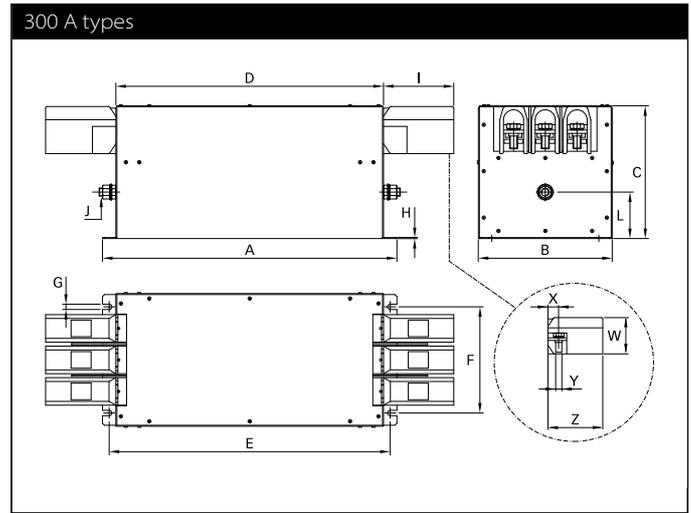
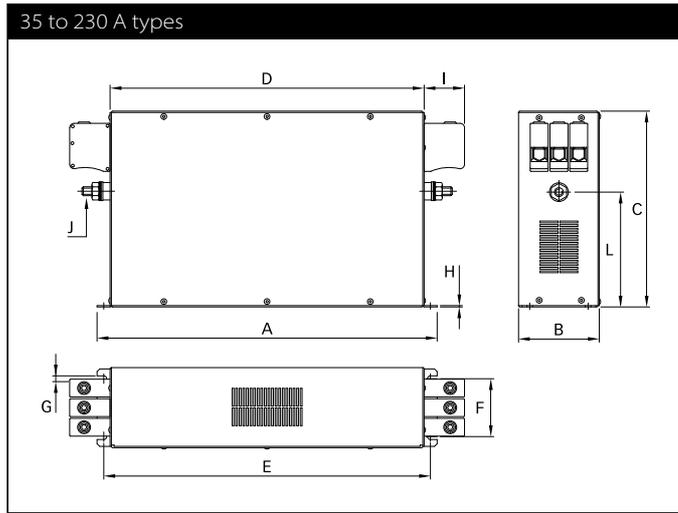
200 A types



230 and 300 A types



### Mechanical data



### Dimensions

	35 A	50 A	80 A	110 A	150 A	200 A	230 A	300 A
<b>A</b>	335	329	379	379	438	438	438	440
<b>B</b>	60	80	90	90	110	110	110	200
<b>C</b>	150	185	220	220	240	240	240	200
<b>D</b>	305	300	350	350	400	400	400	400
<b>E</b>	320	314	364	364	413	413	413	420
<b>F</b>	35	55	65	65	80	80	80	160
<b>G</b>	6.5	6.5	6.5	6.5	6.5	6.5	6.5	8
<b>H</b>	1	1.5	1.5	1.5	4	4	4	1.5
<b>I</b>	25	39	45	45	51	51	51	105
<b>J</b>	M5	M6	M10	M10	M10	M10	M10	M12
<b>L</b>	93.5	107	129	129	108	108	108	70
<b>W</b>								71.5
<b>X</b>								~22
<b>Y</b>								M12
<b>Y</b>								~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
<b>Solid wire</b>	 16 mm <sup>2</sup>	 35 mm <sup>2</sup>	 50 mm <sup>2</sup>	 95 mm <sup>2</sup>	 -
<b>Flex wire</b>	10 mm <sup>2</sup>	25 mm <sup>2</sup>	50 mm <sup>2</sup>	95 mm <sup>2</sup>	150 mm <sup>2</sup>
<b>AWG type wire</b>	AWG 6	AWG 2	AWG 1/0	AWG 4/0	AWG 6/0
<b>Recommended torque</b>	1.5 - 1.8 Nm	4.0 - 4.5 Nm	7 - 8 Nm	17 - 20 Nm	27 - 30 Nm

Please visit [www.schaffner.com](http://www.schaffner.com) to find more details on filter connectors.



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