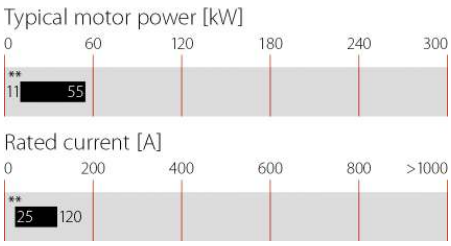
schaffner
energy efficiency and reliability

Add-on Sine Wave Module for Common-mode Voltage Improvement

- Additional module for use with FN 5020 and FN5040/45 sine wave filters
- Reduction of common-mode interferences on motor cables
- Improvement of EMC environment
- Elimination of motor bearing damages
- Possibility to use very long unshielded motor cables
- Improvement of system reliability

Performance indicators



Technical specifications

dc link voltage	1000 VDC max.
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 2000 VAC for 2 sec P –> P 1100 VDC for 2 sec
Lifetime (calculated)	> 10 years (25, 55 A) ~ 5 years (75, 120 A)
Maximum continuous operating voltage	3x 500/288 VAC
Motor cable length	1000 m max. (in combination with FN 5020 only)
Motor frequency	0 to 600 Hz
MTBF @ 50°C/400V (Mil-HB-217F)	>100,000 hours
Overload capability	1.5x rated current for 1 minute, once per hour
Protection category	IP20
Rated currents	25 to 120 A @ 50°C
Switching frequency	6 to 15 kHz
Temperature range (operation and storage)	-25 °C to +100 °C (25/100/21)

Approvals

RoHS

Features and benefits

- Add-on output filter module for the use with FN 5040 / 45 or FN 5020 sine wave output filters with corresponding current rating.
- Elimination of premature motor failure caused by bearing damage.
- Eliminates interference propagation towards components or conductors in the vicinity.
- Restricts pulse currents to ground and hence limits leakage currents in the PE.
- Allows the use of extremely long unshielded motor cables without causing radiation problems (EN 55014, MDS clamp).
- Reduces the required EMI suppression efforts on the line side.
- Allows the use of lower rated drives with long motor cables due to lower losses in the IGBTs and in the motor cable.
- Suitable for rotating fields up to 600 Hz.

Typical applications

- Motor drive applications with extremely long motor cables
- Motor drive applications with unshielded motor cables
- Motor drives and motors in high-speed applications
- Mission critical applications
- Applications with multiple parallel motors
- Retrofit of motor drives into existing installations with old wiring and motors

Important note

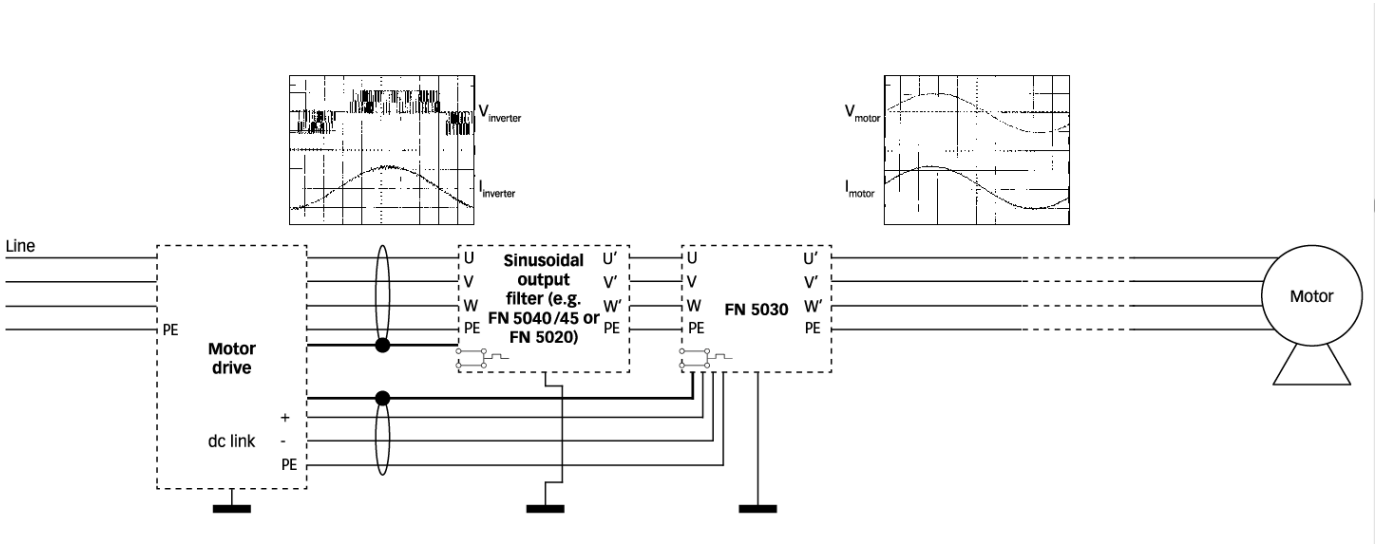
FN 5030 are additional common-mode modules. They can NOT work alone! FN 5030 have to be operated downstream of a regular (symmetrical) sine wave output filter. Possible combinations are FN 5020/FN 5030 for motor frequencies up to 600 Hz, or FN 5040/45/FN 5030 for max. 70 Hz. For additional information please consult the Schaffner application note „Sinus Plus – New Output Filter Concept for Power Drive Systems“.

Filter selection table

Filter	Rated current @ 50 °C [A]	Typical motor power rating* [kW]	Typical power loss** [W]	Output connections	Weight [kg]
FN 5030-25-33	25	15	n.a.	-33	13
FN 5030-55-34	55	30	n.a.	-34	14
FN 5030-75-35	75	45	n.a.	-35	27
FN 5030-120-35	120	75	n.a.	-35	40

* General purpose four-pole (1500 r/min) AC induction motor rated 480 V/50 Hz.
** Exact value highly depends upon the motor cable type and length, switching frequency, motor frequency and further stray parameters within the system. Please contact your local Schaffner partner for individual application support.

Typical block schematic



Temperature monitoring function

All filters of this range are equipped with a temperature monitoring function. The built- in temperature sensor opens a potential-free contact in the case of filter overtemperature (>120ºC).

The maximum switching capability is 6 A/250 V. This function can be used, for example, in the input of a CNC controller or as the trip of a circuit breaker in order to interrupt the mains power supply. Connections are located next to the phase con- nectors (see mechanical data for details).

Forced cooling

The 75 A and 120 A filters provide internal cooling fans which require external power supply (24 VDC/~4 W). Connections are located next to the connectors of the temperature sensor (see mechanical data for details).

Connection to the dc link

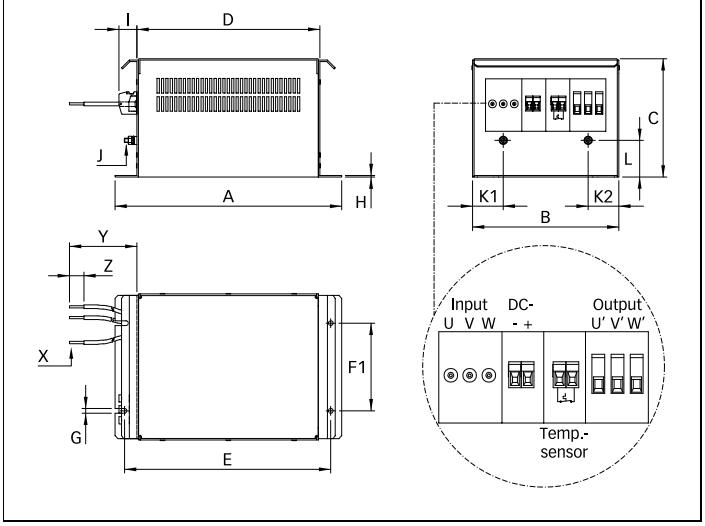
For best results, the connection to the dc link of the motor drive is required with this series of filters.
If only one connection to the dc link is brought out of the drive («+» or «-») then the dc link cable connections from the filter (identified by «DC+» and «DC-» must be connected together to the «+» or «-» motor drive connection.

The operation of the add-on sine wave output filter is not seriously affected as a result. The «+» and «-» connections on the motor drive must never be connected together. Otherwise a short-circuit will result.

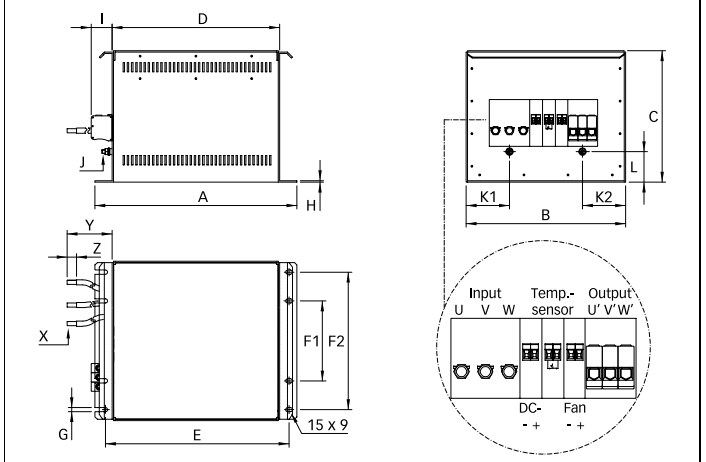
The PWM switching frequency must lie within the range from 6 to 15 kHz in order to ensure satisfactory operation of the filter. A lower switching frequency or a pure square wave is unsuitable and will result in the motor drive switching off with the error message «overcurrent» or «short to earth».

Mechanical data

25 and 55 A types



75 and 120 A types



Dimensions

	25 A	55 A	75 A	120 A
A	310	354	434	434
B	200	250	343	343
C	162	200	283	283
D	246	300	360	360
E	280	324	395	395
F1	120	170	172	172
F2			296	296
G	6.5	9	9	9
H	2	3	3	3
I	25	39	45	45
J	M6	M6	M8	M8
K1	42	70	93	93
K2	42	55	93	93
L	50	66	66	66
X	AWG 10	AWG 6	25 mm2	35 mm2
Y	1000 +20/-0	1000 +20/-0	1000 +20/-0	1000 +20/-0
Z	20	20	20	20

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

Filter output connector cross sections

	-29	-33	-34	-35
Solid wire	6 mm^2	16 mm^2	35 mm^2	50 mm^2
Flex wire	4 mm^2	10 mm^2	25 mm^2	50 mm^2
AWG type wire	AWG 10	AWG 6	AWG 2	AWG 1/0
Recommended torque	0.6-0.8 Nm	1.5-1.8 Nm	4.0-4.5 Nm	7-8 Nm

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

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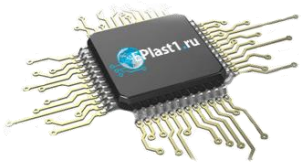

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